

A Database Publication

# electron user

Vol. 6 No 1 October 1988 £1.25

3  
**explosive  
games**

Arcade action  
with Pistol Shooting  
and Gobbler

Educational fun  
with Spencer Spider

DIY electronics  
manual reviewed

Basic rom routines revealed

New Music 5000 16 channel  
stereo synthesiser on test

**WIN**  
Music 5000  
or Cuddly  
Repton



# PLAY IT AGAIN SAM 3

SUPERIOR  
APPROVED

## COMMANDO

**COMMANDO**  
The Smash No. 1 Hit from Elite  
Super Joe - Cross Combat Soldier  
- Light-in-the-dark battles against  
overwhelming odds. An action  
and tension of the World's Number  
One Arcade Game.  
Non-stop Commando action!  
The Micro Level.



A  
Superior  
Hit

## PALACE OF MAGIC

**PALACE OF MAGIC**  
A Superior Software Chart Teeper  
Over 100 screens of challenging  
puzzles and awesome logic  
Even better than Crossword!  
"This is excellent... I can't wait to  
get back to solving it!" A & B  
Computing



SUPERIOR  
APPROVED

## KILLER GORILLA

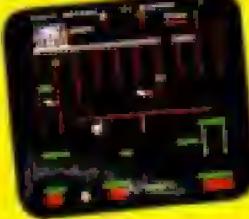
**KILLER GORILLA**  
A Classic from Micro Power  
Scale the framework tower to unravel  
the madman's crazed help. Race  
along the garden, crawl along  
conveyors and jump on to moving  
elevators.  
"Killer Gorilla is an excellent version  
of the arcade game".  
A & B Computing.  
A classic game!



A  
Superior  
Hit

## KILLER GORILLA 2

**KILLER GORILLA 2**  
Superior's Authentic Sequel  
Climb the vines, chains and laser  
beams, avoiding the electric spikes  
and vicious cartoon birds.  
When first released, it was awarded  
a maximum of 4 stars by Home  
Computer Weekly.  
"You'll need a lot of skill... the  
initial level remains high."  
Popular Computing Weekly



### A CHART-TOPPING COMPIRATION for the BBC Micro and Acorn Electron

Superior Software has carefully selected two of the greatest games from other software houses and combined them with two of its own top hits. The result is a top quality four-game compilation that combines variety with great value for money.

BBC Micro Cassette ..... £9.95      Acorn Electron Cassette ..... £9.95  
BBC Micro 5½" Disc ..... £11.95      BBC Master Compact 3½" Disc ..... £14.95

(Compatible with the BBC B, B+ and Master Series computers)

Please make cheques payable to "Superior Software Ltd".

### PRIZE COMPETITION

£100 is the 1st prize in our PLAY IT AGAIN SAM 3 competition, with prizes of computer games for 20 runners-up.

To enter the competition, you must answer one question about each of the four games in the compilation. To answer the questions you will need to have reached an advanced stage in each of the games.

Closing date: 28th February, 1989.

**SUPERIOR  
SOFTWARE**  
Limited

ACORN SOFTWARE

Acornsoft is a registered trademark of Acorn Computer Ltd. Superior Software Ltd is a registered user.  
Dept 13PSS, Regent House, Skinner Lane, Leeds LS7 1AX. Telephone: (0532) 459453.

The screen pictures  
show the BBC Micro  
versions of the games.



24 HOUR TELEPHONE  
ANSWERING SERVICE FOR ORDERS

### OUR GUARANTEE

- All mail orders are despatched within 24 hours by first-class post
- Postage and packing is free
- Faulty cassettes and discs will be replaced immediately  
(the cost will be at your expense)

# CONTENTS



## Cover Stories

### 31 Spencer Spider

Brush up on your spelling with this fun educational game for youngsters.

### 51 Gobbler

Arcade action at its best in this mini listing of a classic game.

## 23 Pistol Shooting

How keen is your sight? And how steady is your hand? Find out in this exciting sports simulation.

## 4 News

All that's new in the ever-expanding world of the Electron, plus the latest Gallup software chart.

## 6 10 Liners

More mini programming marvels from our many talented readers.

## 8 Music Machine

A review of the new Music 5000 - the add-on which turns your micro into a synthesiser.

## 11 Arcade Corner

A whole host of hints and tips for arcade game players.

## 14 Software

Shark, Breakthrough, Plane Crash, Golf and Darts are put to the test by our panel of expert reviewers.

## 18 Rom Routines

Our exploration of the Basic rom continues with a look at how variables are stored.

## 21 Competition!

Win a Music 5000 for your micro - or a cuddly teenage Repton - in our free-to-enter contest.

## 26 Book Review

Our hardware expert examines a new DIY guide to the world of micro electronics.

## 36 Pendragon

More hints, tips and magic spells from our resident adventure wizard.

## 41 Micro Messages

The pages you write yourselves. A selection from the hundreds of letters in our bulging mailbag.

## 45 Aussie Suds

Get your free copy of Riverdale's latest superb adventure by ordering this month's Electron User cassette now.

## 48 Hardware Projects

Joe Pritchard continues with the construction of the user port for Plus 1 owners.

Published by  
Database  
Publications Ltd

Europa House,  
Adlington Park, Adlington,  
Macclesfield SK10 4NP.

Tel: 0625 878888  
(Editorial, Admin, Advertising)  
0625 879940 (Subscriptions)

D/Gold Mailbox 72, M46001  
Preston, PR4 6BB.  
Tele: 031 2188888 DB

ABC

26 123 July December 1987

Managing Editor  
Derek Meakin

Group Editor  
Alan McLachlan

Features Editor  
Roland Waddilove

Production Editor  
Peter Glover

Reviews Coordinator  
Pam Turnbull

Promotions Editor  
Christopher Payne

Advertising Sales  
John Snowden  
Peter Babbage

News trade distribution:  
Diamond Europress Sales & Distribution, Unit 1, Burgess Road, Leyhouse Lane, Hastings, East Sussex TN35 4NR Tel: 0424 430422.

Printed by Carlisle Web Offset

Repton User is an independent publication. Acorn Computer Ltd are not responsible for any of the articles in the magazine or for any of the systems reviewed.

Electron User welcomes program listings and articles for publication. Material should be typed or computer-printed, and preferably double-spaced. Program listings should be accompanied by cassette, tape or disc. Please enclose a stamped, self-addressed envelope, otherwise the return of material cannot be guaranteed. Contributions accepted for publication will be on an all-rights basis.

Subscription rates for  
12 issues, post free:

£15 - UK  
£23 Europe & Eire  
£38 Overseas  
1988 0952 3057

© 1988 Database Publications Ltd. No material may be reproduced in whole or in part without written permission. While every care is taken, the publishers cannot be held legally responsible for any errors in articles or listings.

Database Publications is a  
division of Europress Ltd.

## Back to school

10 educational  
games for the  
Electron for just £5.95

# Gallup Software Chart



THIS MONTH	LAST MONTH	TITLE (Software House)	COMMENTS	PRICE
<b>1</b>	1	<b>BARBARIAN</b> <i>Superior</i>	If you are a fan of games which simulate physical combat, martial arts and the like, you will find Barbarian an excellent acquisition.	<b>9.95</b>
<b>2</b>	2	<b>SOCER BOSS</b> <i>Alternative</i>	Still in second place behind Barbarian and holding its own against a host of new releases. Excellent value for this football manager-type game.	<b>1.99</b>
<b>3</b>	•	<b>RAVAGE</b> <i>Blue Ribbon</i>	Highest new entry this month is from Blue Ribbon. This one should stay around for a while. Look out for Ribbon's new CDS release.	<b>1.99</b>
<b>4</b>	5	<b>ROUND ONES</b> <i>Alternative</i>	Breakout strikes again, with you controlling a B.A.L.L. - a Block Assault Laser Launch. The usual mystery blocks abound.	<b>1.99</b>
<b>5</b>	3	<b>REPTON THRU TIME</b> <i>Superior</i>	This new one only reached third place, yet still a must for anyone loathe to miss any Repton screen. As usual, plenty of puzzles and challenges.	<b>6.95</b>
<b>6</b>	16	<b>STEVE DAVIS SNOOKER</b> <i>Blue Ribbon</i>	Back in the Top Ten again - and as long as Steve Davis continues to win snooker matches this game will continue rearing its head.	<b>1.99</b>
<b>7</b>	•	<b>CREEPY CAVE</b> <i>Atlantis</i>	A strange place to lose your keys, but stranger things have happened. Fun, colourful and an enjoyable romp chasing a mischievous ghost.	<b>1.99</b>
<b>8</b>	4	<b>STAR FIGHT</b> <i>Alternative</i>	Into the great unknown - a fun and simple space shoot-'em-up. Not the most original concept, and this one doesn't offer anything new.	<b>1.99</b>
<b>9</b>	6	<b>COMBAT LYNX</b> <i>Alternative</i>	This wartime helicopter simulation sets a mission for the more adventurous. A good introduction to the world of flight simulators.	<b>1.99</b>
<b>10</b>	14	<b>AROUND THE WORLD IN 40 SCREENS</b> <i>Superior</i>	Repton's second appearance in the chart, and still looming large. This time on a trek through the Orient, America, Africa, the oceans and the Arctic.	<b>6.95</b>
<b>11</b>	7	<b>PSYCASTRIA</b> <i>Alternative</i>	An old favourite which is still in the charts - join in by shooting ammo dumps while avoiding the aliens in this scrolling shoot-'em-up.	<b>1.99</b>
<b>12</b>	8	<b>SPY CAT</b> <i>Superior</i>	Spycatcher spoof, with you trying to escape to Greenland to write your memoirs, on the way visiting No 10 and avoiding surveillance.	<b>9.95</b>
<b>13</b>	18	<b>WAY OF THE EXPLODING FIST</b> <i>Mastertronic</i>	Martial arts is a perennial favourite both with software houses and gamers. This is a good budget priced example of the genre.	<b>1.99</b>
<b>14</b>	12	<b>PAPERBOY</b> <i>Elite</i>	This arcade conversion is your chance to deliver your neighbour's morning papers with the maximum of damage - beware of dogs and cars.	<b>9.95</b>
<b>15</b>	15	<b>BRIAN JACK'S CHALLENGE</b> <i>Mastertronic</i>	How many people remember either Brian or the television programme Superstar Challenge? If you do it might stir some memories.	<b>1.99</b>
<b>16</b>	13	<b>TRIPLE DECKER 3</b> <i>Alternative</i>	Compilations are always about and Alternative has produced 10 Triple Deckers now. Here are Lunar Invasion, Lunar Lander and Jam Butty.	<b>1.99</b>
<b>17</b>	•	<b>QUEST</b> <i>Superior</i>	The addition of gimmicks like the jet boots and computer terminals maintain the interest. A nice arcade game which is more than a little addictive.	<b>9.95</b>
<b>18</b>	•	<b>ANARCHY ZONE</b> <i>Atlantis</i>	This must rate as a superb bargain arcade game that mustn't be missed. If you like fast action you'll be quite at home.	<b>1.99</b>
<b>19</b>	•	<b>CHUCKIE EGG</b> <i>A&amp;F</i>	One of the very earliest games it has returned to the charts. Beware of ostriches and ducks as you search for eggs among the ladders.	<b>9.95</b>
<b>20</b>	•	<b>GRID IRON</b> <i>Top Ten</i>	If you want a rest from the English weather and football, cross the Atlantic to manage an American Football team with all the associated problems.	<b>2.99</b>

# electron NEWS

## Wet weather boosts market prospects

WET weather this summer has apparently not damped Electron users' enthusiasm for computing.

Perhaps because indoor activities have been appropriate, sales of Electron products have held up well during the summer months, an *Electron User* survey reveals.

"We expected a quiet period during which we could get on with designing new products," said Pres boss John Huddleston.

"Instead we've been working flat out to meet demand for existing products while still maintaining a

heavy programme of new product development.

"Interest in the AP7 battery-backed ram has been keen, even before the official launch, and the Advanced Games Compendiums have sold very well."

"And response to the Music 5000 synthesiser shows that Electron owners welcome opportunities for exciting new experiences in computing."

"We're very encouraged that people appreciate our strategy of upward compatibility to the BBC

range in the design of our products".

Work continues at Pres on Advanced Basic Editor+, Advanced File Manager and the 1MHz Bus unit.

"The AFM is currently being documented and should be ready for launch at the Electron & BBC Micro User Show in November", said Huddleston.

The show takes place at the New Horticultural Hall, Greycoat Street, London, on November 11 to 13.

A money-saving advance ticket order form is on Page 13.

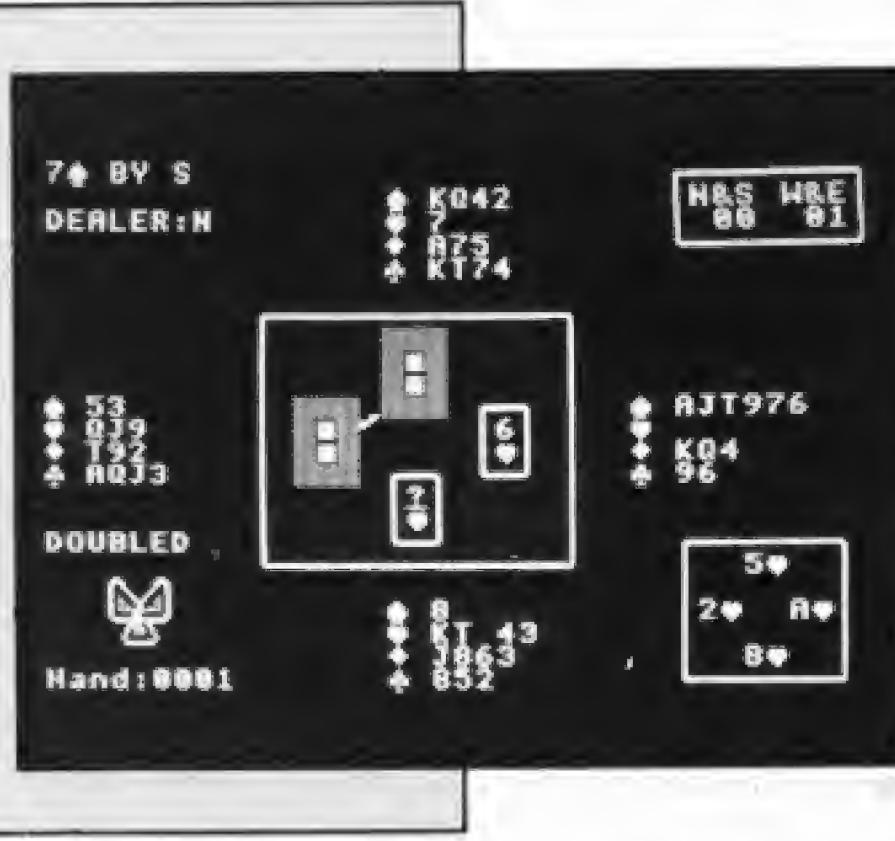
## Take a hand..

AN Electron version of the best-selling card-play simulation *Colossus 4.0 Bridge* has been released by CDS Software.

It serves as a tutor for beginners and a practice opponent for experienced bridge players.

"The program plays the Acol system and incorporates three popular conventions - Blackwood, Stayman and Baron", said CDS marketing manager Dave Carlos.

*Colossus 4.0 Bridge* from CDS (0302 21134) costs £11.99.



## Electron in a class of its own

ELECTRONS play a big role in the lives of children at Carlton Green Primary School, Lancs.

There are 11 machines at the school where they are used in a variety of administration and teaching applications.

"Many pupils also have their own Electrons at home", said Peter Higgins,

the teacher who began Carlton Green's computer programme six years ago.

"The children often initiate projects on their own cassettes and then bring them to school for further development."

"The beauty of the Electron is that we can use it as a workstation for the

entire upwardly compatible Acorn family with the aid of View, Mini Office and other programs and networking on the BBC Micro and Master.

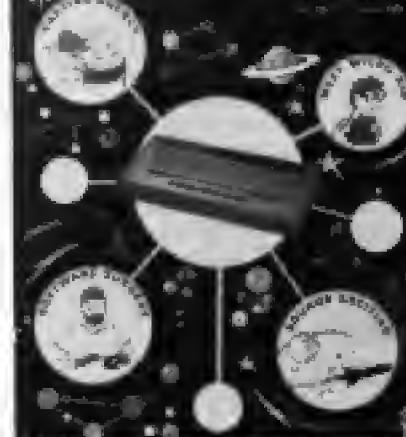
"Almost anything is possible - I'm sitting here with an Electron producing worksheets."

"I'm running a database and even

doing desktop publishing on it, using the disc drive as memory with shuttle load and save."

Peter Higgins is leaving Carlton Green to take up a headship at another local school this term - "But Electron computing will be one of the first projects I shall undertake in my new job", he promised.

## electron user



Flashback - the first issue

## Changing with the times

WELCOME to your new-look *Electron User*. Its comprehensive re-design is intended to reflect the way the machine and its users have developed in recent years.

Features presented in three columns per page make for easier readability, particularly in the listings section.

The software reviews will retain their recently introduced colourful format - but reviews will be bigger and there will be "second opinions" on every game.

"In line with the way the user base has matured, *Electron User* will be more serious, less juvenile in its content and appearance", said Features Editor Roland Waddilove. "We look forward to hearing from readers about their reactions".

# Scroller

Written by Paul A. Clarke

MESSAGE scrolling utilities have appeared from time to time in various computer magazines – but here's one with a difference.

Message Scroller from Paul Clarke is a machine code program which scrolls a small text window – 32 characters wide by 1 character deep – across a Mode 4 screen.

The first difference is that this version doesn't scroll character by character, but pixel by pixel. And as it's in machine code, you're not limited to using graphic modes only.

Although the display as set up in the program will look best in the program will look best in Mode 4, you

can use the utility in any other two-colour mode by altering the value of start in line 30 – but you must set it to a valid 16 bit address within the screen memory.

The width of the window is always 32 bytes – or characters – from start, so

```
10 REM Message Scroller
20 REM By Paul A. Clarke
30 MODE4:start=87898:FORT
=BT02STEP2:PX=8900:JMP
=LOA#1:BNELoop3:RTS:.store
LOA#1:STA#70,X:JMPret1:.add
next CLC:LDA start-8,X:ADC#1
:STA start-8,X:JMPret2
60 .storeend CLC:LDA star
t+248,X:ADC#1:STA start+248,
X:JMPret3:J:NEXT
70 COLOUR129:CLS:COLOUR12
8:FORT)=BT0255STEP4:ITX+sta
rt)=0:NEXT:PRINTTAB(4,26);"W
ritten by Paul A. Clarke":?6
220=0:78221=9:+FX14,4
```

bear this in mind when trying to centralise the window in 80 column modes.

The second difference is that the scrolling is carried out under the control of interrupts. This means that once you've run the pro-

gram, you can load, edit and run other Basic programs without disturbing the scrolling.

Of course, should you overwrite the message window in the process, it'll corrupt the scrolling message.

```
60 VDU23,128,&F0FB;1F0T0;
&F0FB;ES0FB:;GC0LD,B:COLOUR1
29:COLOURB:PRINTTAB(0,0);"Sc
roller"
90 VDU5:X=72:Y=700:FORT=1
020T0992STEP4:FORM=BT0255ST
EP4:X=k+16:IFPOINT(M,T)=0 NO
YEN,Y:VDU128
100 NEXT:Y=Y-32:X=72:NEXT:
VDU4,23,1,0,0,0,0,:PRINTTAB(
0,0);STRINGS(0,CHR$32):REPEA
TUNTIL0
```

# ROM MANAGER

ROM Manager from David Manning is a routine for disc users only which allows you to display a list of all roms present in your Electron. It also provides the facility to disable any of them at will until they are either re-enabled, or the power is turned off.

This last feature is a very useful, as some roms interfere with various games programs or claim more workspace than you can afford to lose.

Rom Manager works by using the buffer for sound channel three – from &870 to &87F – to hold a list of those roms currently disabled.

So long as this area is left alone by not using sound channel three, Rom Manager will remember the status of all 16 roms, even after a Control+Break. This

is achieved by using osbyte 247, 248 and 249 to cause any depression of the Break key to scan Rom Manager's private table.

If any rom is listed as disabled, a zero is poked into the Electron's own rom table at &2A0-&2AF, preventing that rom from being subsequently recognised by the operating system.

Once run, the Rom Manager Basic program may be NEWed, leaving the machine code utility permanently installed in page &900.

Running any other utility which needs this area is not recommended, as it could cause a crash on the next star command or pressing the Break key.

To list the roms type \*R. This causes the titles of all 16 to be displayed beside

their socket numbers, unless any sockets are empty. Disabled roms will be shown, with an asterisk next to their name.

To disable or re-enable a rom, type:

```
?62AX=0:REM disable
?62AX=1:REM enable
```

where X must be a socket number between 0 and F. It's useful to do a \*R prior to disabling or re-enabling any roms, so that you can see the number of the one you want to deal with.

It's best to press Control+Break after disabling or re-enabling a rom, so that the operating system can properly test for its presence. Users of Pres's new AP2 rom and BBC Master owners will be familiar with this method of rom handling.

Don't try disabling the Basic rom though – you'll have to turn your Electron off and on again to regain control, because the ? indirection operator used to re-enable roms is only available from within Basic.

# AMAZING OFFERS

## JOYSTICKS

VOLTMACE DELTA  
3B TWINS

(for use with Plus 1 or BBC)

Normally £19.95 –  
NOW £17.95!

ELECTRON JOYSTICK  
INTERFACE & SOFTWARE  
£14.95

QUICKSHOT II TURBO  
JOYSTICK  
£13.95

Buy both for only £24.95!



Quickshot I ..... £4.95  
Quickshot II ..... £11.95  
Cheetah 125 ..... £9.95

## SPECIAL OFFER

Cricket	Uranians
Skyhawk	Hunkldory
Jack Attack	Star Force Seven
Ice Hockey	Plan B
Tennis	Squeakaliser
Roboto	Savage Pond
Twin Kingdom Valley	

ANY 5 FOR £9.95

## SUPERIOR DEAL!

Deathstar	Repton 2
Mr Wiz	Repton 1
Chess	Draughts
Tempest	Overdrive
Fruit Machine	Stranded
Invaders	

ANY 5 FOR £9.95

Acornsoft Hits 1 ..... £4.95  
Acornsoft Hits 2 ..... £4.95  
Karate Combat ..... £4.50

## ELECTRON SPECIALS

ELECTRON COMPUTERS ..... £59.95

(Includes power supply aerial lead & 90 day warranty)

PLUS ONE INTERFACE ..... £49.95

### PACKAGE ONE

PLUS 1, VIEW & VIEWSHEET ..... £69.95

### PACKAGE TWO

ELECTRON COMPUTER, PLUS 1 & VIEW ONLY ..... £109.95

### PACKAGE THREE

VIEW & VIEWSHEET ROMS ..... £21.95

### PACKAGE FOUR

LOGO, VIEW, VIEWSHEET for ..... £49.95

And get Lisp Rom = **FREE**

### PACKAGE FIVE

PLUS 1, VOLTMACE 3B TWIN JOYSTICKS with VIEW or VIEWSHEET ..... £71.95

### PACKAGE SIX

PLUS 1, LOGO, VIEW, VIEWSHEET. £109.95

And get Lisp Rom = **FREE**

**THOMSON**  
12" Green Screen  
High Resolution  
**MONITORS**

Now only  
£69.95

BBC or Electron lead supplied



## EDUCATION SPECIALS

Linkword Spanish
Linkword Italian
Talkback
Workshop
Maths 'O' Level II
Where?
Biology
English

ANY 2 £3.95!

## NEW FANTASTIC OFFER!

Rediffusion

### TV TUNER

Turns your monitor into a TV!

\* 7 channel option \*

\* Push button control \*

(Works with any monitor with a composite video output)

**£49.95!!**

Electron Power Supply	.....	£9.95
View	.....	£14.95
Viewsheet	.....	£14.95
Logo	.....	£24.95
Lisp (Rom)	.....	£9.95
Lisp (Cass)	.....	£2.95
Mini Office I	.....	£4.45
Advanced User Guide	.....	£2.95

## RECENT RELEASES AT SPECIAL PRICES

	Cost	3.5" Disc
Barbarian	7.45	-
Bone Cruncher	7.45	-
Codename Droid	7.45	11.50
Craze Rider	7.45	11.50
Elixdr	7.45	-
Life of Repton	5.95	-
Palace of Magic	7.45	-
Play It Again Sam	7.45	-
Play It Again Sam II	7.45	11.50
Quest	7.45	-
Repton Thru Time	5.25	-
Spellblinder	7.45	-
Spycat	7.45	-
Strykers Run	7.45	-
Superior Col. 3	7.45	-
Summer Olympiad	7.45	-

## MICROPOWER GAMES

Felix in the Factory	£2.95	Stock Car	£4.95
Croaker	£2.95	Swoop	£2.95
Bumble Bee	£2.95	Jetpower Jack	£2.95
Gauntlet	£2.95	Galactic Commander	£2.95
Killer Gorilla	£2.95	Moonraider	£2.95
Rubble Trouble	£2.95	Bandits at 3 O'Clock	£2.95
Electron Invaders	£2.95	Adventure	£2.95
Felix Fruit Monsters	£2.95	Swag	£2.95
Chess	£2.95	Escape from Moon Base	£2.95
Danger UX8	£2.95	Ghouls	£2.95
Frenzy	£2.95	The Mine	£2.95
Felix meets the Evil Weevils	£2.95	Gyroscope	£2.95

Any Five for Only £7.95

## HOME INTEREST

Crazy Tracer	£2.95	Desk Diary	£6.95
Snapper	£2.95	Graphs & Charts	£4.95
Boxer	£2.95	Theatre Quiz	£4.95
Turtle Graphics	£2.95	Watch Your Weight	£6.95
Chess	£2.95	The Complete Cocktail Makers	£2.95
Business Games	£2.95	Sci Fi Quiz	£2.95
Crime and Detection	£2.95	Dating Game	£2.95
Music Quiz	£2.95	Royal Quiz	£2.95

Any Five for Only £7.95

\* Please add 95p P&P (Overseas £3.50).  
Make cheques /PO payable to Software Bargains  
\* All prices include VAT  
\* Goods despatched within 48 hours - subject to availability  
\* Out of hours answerphone: 0532 687735



Dept. EU10 8, 8A Regent Street, Chapel Allerton, Leeds  
LS7 4PE. Tel: 0532 687735 or 0532 687789

We can offer attractive discounts for all educational establishments, phone or write for a quote.

We supply a catalogue of our entire stock range per machine type with every order.



# They're playing your tune, Electron

**W**HEN Acorn launched the Electron it is probably true to say that no one envisaged it being used to control a music system. Much less, I'm sure, did anyone suspect that it would one day be at the centre of a digital synthesiser complete with programmable instruments, a computerised mixing desk, stave editor and its own MCL (Music Composition Language).

Well now, thanks to the efforts of Hybrid Technology and Pres, it is.

The Hybrid Music System was originally developed to run on the BBC Micro and it is now available for the Electron. Happily however, it is not a cut down version but a full-scale implementation of the system, with only one or two functional differences which we'll look at in a moment.

The first thing you need – apart from the Hybrid Music System itself – is a couple of interfaces. You'll need the Pres APS interface and an &EOD

**Ian Waugh examines the Hybrid Music System, once only available for the BBC Micro but now adapted for the Electron**

DFS, plus a disc drive. You also need suitable amplification. You can listen to the system through your hi-fi or even through headphones, but the output is in stereo so a hi-fi system will give you the best results and is much recommended.

The system runs under a new language called Ample (Advanced Music Production Language and Environment). The Ample rom plugs into the APS's internal rom socket and a ribbon cable from the hardware box, which contains all the

synthesiser bits, plugs into the 1MHz bus. As the software is rom based it doesn't use precious memory, although modules must be loaded from disc [modules coming up] as required, the same procedure as used with the BBC Micro version.

The box containing the hardware is exactly the same as the BBC Micro unit and the manual is the one supplied with the big brother version. An additional two-page leaflet describes the differences between the systems, and these are really quite minor.

Operation is exactly as described in the User Guide except for some differences in display and the keyboard. For example, you must press Control+1 instead of Tab, and Func and a key for the function keys – but Electron users are used to doing that now. Four other key substitutions must be made, too.

The BBC Micro version uses Mode 7, whereas the Electron uses Mode 6 with a consequent lack of colour. In the Staff Editor this results in horizontal lines which divide the display. It's still perfectly useable, it's a little odd.

Having booted up, you are presented with the front end of the system called the Studio 5000. From here you can enter any of the three main modules – the Mixing Desk, Staff Editor and Notepad – as well as loading and saving programs, although all this can also be done from the other modules.

The first thing you'll want to do is load and play the set of demo programs. Pressing F9 loads a Juke Box which makes selection simple and easy. Some of these pieces are extremely impressive. If you have ever cocked an ear at Hybrid's stand at the Electron and BBC Micro User Shows you'll know what I mean. After being suitably impressed you can go back to the Studio 5000 menu and work your way through the modules.

Before taking you on a guided tour, it's worth saying a few words about Ample, because it really is the heart of the system – although it will often be transparent to the user. The basic unit is

Studio 5000 Notepad ID 108638  
got "jupiter" to make "jupiter"  
trying "RETGATE"  
-----  
24.  
X phrase 1  
0: eG A/ACbg CDc/b/ aBa/g/ e///  
0: eG A/ACbg CDc/b/ Edc/D/ c///  
X phrase 2  
0: Ge d/d/cE d/g/Ge d/d/Eg A///  
0: ab C/b/a/ g/C/e/ dcD/E/ G///  
X phrase 1, an octave higher  
1: eG A/ACbg CDc/b/ aBa/g/ e///  
1: eG A/ACbg CDc/b/ Edc/D/ c///  
-----  
XSHOW  
do jupiter  
2 words, no data  
X

The Notepad showing part of Holst's Jupiter in Ample notation

Intro



Studio 5000 Mixing Desk ID 109638							
editing "mix"							
8(tune)	OFF FAST	49 beats	OFF PAUSE				
105 tempo	OFF over	ON group					
1-1 1-2 2-1 3-1 3-2 3-3 3-4 4-1							
synverb	elecorgan	elecorgan	pedal				
Ins	synverb	elecorgan	elecorgan				
	brassbow		elecorgan				
1	2	3	4	5	6	7	8
Pan	2	0	-3	-2	0	2	0
	-	x	x	-	-	-	-
Vol	1	1	1	1	1	1	1

Mixing Desk – all parameters can be altered on the fly

the word, and words can contain anything or be defined to do anything. For example, a word can contain a riff, a chord sequence, an instrument definition or it can call up an action such as a tempo change.

Words can be defined in terms of other words, and there will eventually be a single word at the very top of your program which will start all the music lines playing at once.

Operations are stack based and Ample syntax is similar to the postfix notation used in Forth. If you're not a postfix fan, however, don't let that put you off because the system is quite easy to understand and use. No stack use is necessary except for advanced programming. In normal use you simply put the number before the word, for example, 6 MODE, "filename" LOAD, 8 VOICES, and so on.

Language buffs note: Ample is a complete language – in fact the Studio 5000 software was written largely in Ample. We lesser mortals can simply use the music parts of the language to produce music.

As well as supporting traditional notation Ample contains its own music composition language (MCL) which is ultimately more flexible and versatile; more of this in a moment. Hybrid has designed the system and software to be fully expandable, and new features can be used simply by installing new software modules.

Time to open the User Guide. It is excellent and leads you gently through the system. The first module it describes is the Mixing Desk and we'll follow suit and do likewise.

This screen displays a mixing desk console. The system generates 16 sound channels which are normally paired to produce eight two-channel voices, although you can use all 16 on one voice if you wish. The mixer has eight channels – one for each voice – complete with faders, stereo positioning (pan pots) and volume meters.

The instruments playing on each voice are shown above the pan pots. Pressing Shift clears the bottom half of the screen and gives you a list of available instruments which can be selected with the cursor keys. Releasing the Shift key will

transfer that instrument to the mix.

Changing instruments on a voice can take place while the music is playing so you can hear how the piece sounds as you make alterations. This concurrency is an important part of Ample and you'll find you can alter most parameters while music is playing.

You can pan a sound through seven stereo positions, transpose the piece and alter the tempo. When you've produced a mix you like, type MAKE and the system will automatically produce a word containing all the settings. You can produce several different mixes or sub-mixes and use them at any point in the music.

You can pause and fast forward the music and you can step through it a beat at a time. Many of these features are only possible with a computerised system.

### The staff editor

The next module in the book is the Staff Editor. This supports the full range of notes, rests and accidentals along with slurs, triplets, duplets, dots and ties. You don't have to use bar lines but if you do the system will automatically check the length of each bar. You can define the on-time of the notes to produce legato and staccato phrasing, and can include dynamics (volume) and accents.

Chords can be entered, too, although the notes are staggered across the stave rather than appearing vertically. Coupled with the horizontal lines, it does give a rather broken appearance to the screen but it is quite easy to adapt to.

You can program non-standard key signatures and define words relating to performance expression. You can also produce percussion patterns on the treble clef.

The Staff Editor is ideally suited to anyone working with traditional music and perfect for copying traditional music scores from sheet music.

More than that, however, the system can translate the music you produce on the stave into

Ample's MCL in the Notepad. The Notepad brings you nearest to the Ample ideal. It is a screen-sized text editor which can be used to produce music or to create or edit instrument sounds.

Ample music notation is very simple. Notes are called by their usual names, A to G, and the duration and octave are determined by initial numeric settings. Upper case letters indicate a rise in pitch from the last note and lower case letters represent a fall in pitch.

Notes can be lengthened either by specifically increasing the duration or, more usually, by putting a slash character (/) after the note. Here's the first four bars of Good King Wenceslas:

24, B: (C)(C) ccg! AgAB C/C/

The first figure, followed by a comma, sets the beat length and the next figure, followed by a colon, sets the octave.

This notation is arguably easier to understand and more logical than traditional notation. It supports chords and the full range of accidentals, and because it is text-based it is fairly easy to manipulate notes and music with programming techniques such as loops.

This can lead you into an absolutely fascinating area of music, that of applying computer power to the composition process. It's not too difficult and I have produced several pieces of computerised music, some of which have been described as Tangerine Dream like.

Ample also provides elements that are not included in traditional staff notation, such as negative notes – going back in time for pickups – and strummed chords. It has built-in special effects, which can also be used on the stave, such as Echo which can be used to create reverb effects and true echoes. These can be detuned, transposed and panned across the stereo image.

Continuous changes in tempo and volume are very rare indeed in computer based music but they are standard fare in the Hybrid Music System. They can even be used to produce autopanning and slide effects.

You can edit words in the Notepad which were created in the Staff Editor and the Mixing Desk, and this is really the module on which the other modules hang.

The Notepad is also where instruments are designed and edited. Switching to Panel Mode allows you to edit instrument characteristics by moving the cursor between different parts of the instrument's parameters. As in the Mixing Desk, selection of waveforms, for example, is made by holding down the Shift key and a list of options appear at the bottom of the screen.

You can choose from 14 waveforms, 17 amplitude envelopes and 17 pitch envelopes. You can add synchronisation and ring and frequency modulation, too.

A unique facility is the ability to design your own panels. You could call up an unmodulated piano sound and type in controls for frequency modulation, ring modulation and so on, in any spare area of the panel. The limited number of waveforms and envelopes is not as restricting as it may at first appear.

The ease of instrument creation helps offset any twinge of regret you may feel about not

Turn to Page 10 ►



**From Page 9**

having full programmability. It would be easy to add an additional waveform editing module to the system and rumour has it that one is currently under development.

The manual contains graphic displays of all the waveforms and envelopes, which are extremely helpful. The system loads with 14 preset instruments and the manual contains details of another 25 for you to type in. You'll get lots more from the demonstration pieces, too.

If you want to delve even deeper into the system watch out for the Programmer's Guide. A

leaflet points out the two main functional differences between the Electron and BBC Micro versions of the system. As the Electron version runs in Mode 6 there is consequently less memory for program storage. Also, as the Electron has less processing power operation of controls and execution of programs is generally slower. This is most evident with programs requiring lots of processing, and the use of Echo can cause a hiccup or two as well.

However, the majority of BBC Micro Ample programs will be compatible with the Electron system, and Electron users can tap into a wide source of programs and assistance in the form of

Ample user groups and bulletin boards.

Hybrid is looking at the compatibility of existing BBC Micro Ample music albums (on floppy disc) with the Electron system and will be supporting the Electron system with its own Ample albums. There are provisional plans to release a keyboard - the Music 4000 - which will allow users to play the system as a synthesiser and enter music into it in real time. There's also the possibility of linking with other units such as a Midi interface.

Hybrid has developed an amplifier called the Music 1000 with three headphone outputs which is ideal for use in the classroom. This is, of course, compatible with the Electron system.

Now at last Electron owners have a music system available for their computer. The combination of a synthesiser with programmable voices, stave editing, a mixing desk plus the computing power of the Ample language makes this system unique. There's really nothing to compare it with.

Not one other personal computer - other than the BBC Micro - has such a fully integrated music system. It has simply got to be one of the best and cheapest ways into computer music. If you want to hear it in action send for the demonstration cassette. You'll want one!

```

Studio 5000 Main Menu      ID 108638
-----
Run program
Notepad
Mixing Desk
Staff Editor
Ready system
Load program
Save program
Catalogue
Help
Commands
-----
XSHOW
RUN          do          glock      mix
oursynth    part1      part2      part3
part4       tarimba    tink
11 words, no data
XMEM
Words: 1534   Data: 8
System: 0     Arrays: 0
Free: 6835
X
X
X

```

Studio 5000  
Main Menu screen  
- the SHOW command  
lists user-defined words

Product: Hybrid Music System Music 5000  
Synthesiser  
Price: £113.85  
Product: Demonstration Audio Cassette  
Price: £2.95  
Supplier: Hybrid Technology/Pres, 6 Ave House, High  
Street, Chobham, Surrey GU24 8LZ.  
Tel: 0276 72046

QUAL-SOFT

# WORLD OF SOCCER

Sports  
simulations

ARE YOU A POTENTIAL 1st DIVISION MANAGER?  
ARE YOU A POTENTIAL ENGLAND MANAGER?

Football management is not a mental arithmetic exercise. Deciding whether a skill level of 6 is a better choice than a skill level of 4 has nothing to do with a knowledge of soccer. Football management is about judgement; YOUR JUDGEMENT! Judgement about a players skills. Judgement of how skills combine to make a successful team. And judgement of the performance of the team on the field of play. Our "WORLD OF SOCCER" games are not so much computer games as computer SIMULATIONS of the world of the soccer manager.

DARE YOU TEST YOURSELF?

## SOCcer SUPREMO

A LEAGUE MANAGEMENT SIMULATION

TAPE 1  
6 Seasons  
League Division 1  
The F.A. Cup

TAPE 2  
European Cup  
U.E.F.A. Cup  
Cup Winners Cup

## MEXICO '86

A WORLD CUP MANAGEMENT SIMULATION

TAPE 2  
World Cup Finals  
Phase 1 (groups of 4)  
Phase 2 (last 16 knockout)

**STILL THE ONLY ELECTRON SOCCER MANAGEMENT GAMES WITH GRAPHICS!**

**\*SPECIAL OFFER: Soccer Supremo & Mexico '86 (4 tapes and 2 manuals packaged as 2 games) £14.95**

Both games are sent by return post, 1st class. Access authorisation accepted over the 'phone

QUAL-SOFT Tel: 0438  
Dept. EU, 721936  
18 Hazlemere Road  
Stevenage SG2 8RX



Please supply:  
Soccer Supremo  £9.95  
Mexico '86  £9.95  
SS & M'86  £14.95

Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
Access No. (if applicable) \_\_\_\_\_

# electron user **ARCADE CORNER** Compiled by MARTIN REED

## Why some pokes don't

I HAVE received a couple of letters saying that some of the pokes featured in previous columns do not work. Now when a poke is featured we always make sure that it actually works on an original version of the game.

However, there is often more than one version of a game - especially with so many being re-released on compilations - so we cannot guarantee that a poke will work on them all.

Don't be disappointed if it doesn't, but consider it a bonus if it does. Better still, why not try writing a routine that works with your particular version?

But please remember that your poke must apply

to currently available versions of the game.

This month's pokes come from Brian Darroch from Ardrosson in Scotland, Jason Fisher from Rickmansworth, Herts, David Donaldson from Amersham, Bucks and Alistair Hammond from St. Helier, Jersey.

Share your hints, tips, pokes and cheats with fellow *Electron User* arcade addicts - but please ensure they are all your own work. Send them to:

*Arcade Corner,  
Electron User,  
Adlington Park,  
Adlington,  
Macclesfield,  
SK10 4NP*

## Boost Elite weapons

*Elite - Acornsoft/  
Superior*

Enter the following program then save it on a blank tape. Change the tape for another blank one and type RUN. This saves a special Commander under the name of CHEAT.

Load Elite as normal, then load this new Commander. You now have a very powerful

```
10 REM Elite Cheat
20 REM
30 REM (C) Electron User
40 REM
50 AX=OPENOUT("E.CHEAT")
60 FOR CX=0 TO 64B
70 READDS$:DX=VAL(C$+DS)
80 SPUTF AX,DX
90 NEXT CX
100 FOR CX=64C TO 8FF
110 SPUTF AX,CX
120 NEXT CX
130 CLOSEK AX
140 DATA 00,14,AD,4A,5A,4B,
02,53
150 DATA 87,77,35,94,00,FF,
```

weapons system and 200 million credits. This should be of help to David Wyeth who asks if I have any cheat routines for Elite.

While this one allows

## Gorilla high-score

*Killer Gorilla - Micro Power*

Here is an interesting routine for this ever-popular game. It allows you to have your own personalised high-score table.

Load and run the game as normal, then when you have finished playing, press Break, put your own blank tape into the recorder, and type:

+SAVE SCORES 1020
+100 286F

When you want to play the game again, start off as usual and wait until the title screen and the GORILLA file have loaded. Then press Escape and type:

\*LOAD =

Press Play on the recorder and wait until the GORILLA2 file has loaded. Now put your blank tape into the

recorder, type:

+RUN

and press Play. The game will now run with your own scores on the high-score table instead of the default ones.

## Want to live for ever?

*Mr Wiz - Superior*

This poke is for Mr Wiz in the Plus 3 disc version of the game in the Superior Collection Volume 3. To start, load Mr Wiz as normal, until the first page of instructions are displayed.

Press the spacebar to continue, then press Escape when the GAME file has loaded. Make sure that the error message given is *Escape*, not *Escape at line....* Now type:

121 ?81484Ex

where *x* is the required number of lives, less one - for instance, set *x* to nine if you want 10 lives.

Although any value up to 255 is acceptable, a value of 13 or higher will corrupt the screen.

For infinite lives, type:

230 REM

Now type RUN to start the game. Can anyone supply an equivalent routine for tape users?

While we're on the subject of Mr Wiz, Chris Dawkins has found that the level jump published in the November 1987 column does not work with his version of the game, but pressing the 1, Caps LK and Q keys simultaneously does the trick.

Chris's point reinforces my own at the beginning of this column - that there is often more than one version of the same game.

# electron user ARCADE CORNER

From Page 11



```
10 REM Codename Droid Ch
eat
20 REM by David Donaldso
n 1988
30 REM (c) Electron User
40 MODE 5:VDU 23,1,0;0;0
;0;:PROGload
50 FOR IX=0 TO 2 STEP 2:
PI=$160:OPT EX
60 JSR $120
70 LDA# $A5:STA $271B:$I
infinite lives
80 LDA# BEA:STA $2999:ST
```

```
A $29BA:$I infinite mines
90 LDA# BEA:STA $3842:ST
A $3843:$I infinite blaster
energy
100 LDA# BA9:STA $28D9:ST
A $28D8:LDAA 0:STA $28A4:ST
A $2AFB:STA $3807:$I infinit
e suit energy
110 LDA# $19:STA $11FF:$I
infinite jet-pack energy
120 LDA# BEA:STA $15B8:ST
A $15DC:$I infinite passcards
130 LDA# BEA:STA $2CAC:ST
```

## Get Droid taped

### Codename Droid – Superior

Following the maps in the April and May 1988 issues of *Electron User*, and last month's Arcade Corner hints, here is a complete set of pokes for the tape version of Codename Droid – the original, not the Play It

Again Sam II version. Enter the following listing as it is, then save it on one of your own blank tapes.

Each cheat feature is clearly labelled, so just delete the lines containing whichever pokes you don't want in that particular game, before typing RUN.

Position the original game tape just before the second DROID file – the one after RUN3 – as that is the only one necessary to play the game.

```
A $2CAB:$I infinite energy c
ells
140 JMP $15C
150 J:NEXT
160 CALL $160
170 END
180 :
190 DEFPROCload
200 !$120=$288047A9:$124
=$E8001A902
210 !$128=$0EA90221:$12C
=$E742004A2
220 !$130=$A03FA2FE:$134
=$FFFF72001
230 !$138=$04A200A9:$13C
=$E4CFFF44C
240 !$140=$4F524426:$144
=$E80004449
250 !$148=$98438448:$14C
=$E83CAAD48
260 !$150=$CA8DFE29:$154
=$E68A84803
270 !$158=$6B286BAA:$15C
=$E2159804C
280 ENDPROC
```

electron  
user

MAIL ORDER OFFERS

electron  
user

MAIL ORDER OFFERS

## This is THE ultimate guide to the Electron!



This detailed guide to the Electron's operating system is a must for every serious Electron User. In its information

- ★ Full details of how to implement the powerful \*FX/OSBYTE calls.
- ★ Page ROMs revealed: The way they work and how to write your own.
- ★ Programming the ULA – all you need to know.
- ★ Full coverage of memory allocation and usage – make every byte count.
- ★ Complete circuit diagram: How to use the Electron's exciting expansion capabilities to the full.
- and much, much more...

Quite simply, the *Electron Advanced User Guide* is THE essential handbook that will allow you to exploit the full potential of the Electron.  
Don't miss this money saving offer!

Only £3.45 (inc. P&P)  
SAVE a massive £6! (Normal price £9.45)

TO ORDER PLEASE USE THE FORM ON PAGE 45

# It's back!

The show that *ALWAYS* keeps you one step ahead

# ELECTRONIC SHOW BBC MICRO USER SHOW EP SHOW

The premier exhibition for users of all Acorn machines returns to its popular venue in the heart of the capital.

Traditionally the liveliest event of the year on the Acorn calendar, the pre-Christmas show is the one you just cannot afford to miss.

It's your value-for-money passport to:

- 70 exhibitors displaying all the latest developments across the entire Acorn range.
- Archimedes World – which provides a fascinating glimpse into the current and future roles for this remarkable machine.
- Technical advice from the UK's leading experts on all Acorn computers.
- Hundreds of special offers for the BBC Micro and Electron waiting to be snapped up as top-value Christmas presents.

All this – and so much more – at the 20th record-breaking Electron & BBC Micro User Show.

You can even save yourself £1 before you get there by using this advanced ticket form.

New Horticultural Hall,  
Greycoat Street,  
London SW1

10am-6pm Friday, November 11

10am-6pm Saturday, November 12

10am-4pm Sunday, November 13



Take a stroll down Innovation Row – a brand new show feature area, specially constructed for the event.

See the grand finalists displaying their breakthroughs in public for the first time. And you can help pick the winners by casting a vote in both categories of the awards – BBC Micro and Archimedes.

#### How to get there

**Underground:** The nearest tube stations are VICTORIA (Victoria, District and Circle Lines), ST. JAMES'S PARK (District and Circle Lines) and PIMLICO (Victoria Line).

**By British Rail:** VICTORIA STATION. The halls are a 10-minute walk from the station.

**By Bus:** 11, 24, 29, 70, 76 and Red Arrow 507 to Victoria Street – alight Army and Navy Stores.



#### Advance ticket order



Please supply tickets for November show:

- Adult tickets at £4 (save £1) ..... £ .....  
 Under-16s tickets at £2.50 (save £1) ..... £ .....  
 Cheque enclosed made payable to Database Publications Ltd  
 Please debit my credit card account:  Access  Visa Expiry date: / /

Total £ \_\_\_\_\_

Admission at door:  
£5 (adults)  
£3.50 (under 16s)  
Advance ticket orders  
must be received by  
November 2, 1988

Name .....  
Address .....  
Signed .....  
Post to: Database Exhibitions, Europa House, Adlington Park, Adlington, Macclesfield SK10 4NP.  
PHONE ORDERS: Ring Show Hotline: 0625 679920  
Prestel Orders: KEY \*89 THEN 614568383  
MicroLink/Telecom Gold Orders: 72:MA6001  
Please quote credit card number and full address

**DATABASE  
EXHIBITIONS**

# RACING



Product: *Shark*  
Price £9.95  
Supplier: ASL, Winchester House, Canning Road,  
Wealdstone, Harrow HA3 7SJ.  
Tel: 01-861 1166



**S**HARK is one of two new titles from Audiogenic, the first this year. The scenario is typical – the bad guys have invaded in force and you, Colonel Charles St John Sharkey, nicknamed Shark, are the only hope. Will you take on this dangerous mission to rid the world of enemy agents? Of course you will.

It turns out to be a multi-screen wargame very much in the mould of Superior Software's Striker's Run – you dash across the screen left to right blasting away at all and sundry, and when you near the edge the screen flicks to the next.

You can jump around the screen from object to object so that one moment you may be running along the ground, and the next precariously balanced edging along an iron girder.

There are a number of different sections: Jungle, barrack square, town streets and more. Each sector is immediately distinctive – in the jungle you can run along the ground and through clearings, and jump up on to giant blocks of stone and large tree branches.

In town you can leap from window ledge to window ledge, the roofs of houses and so on. Clever use of dithering – mixing the pixels of different colours to give the appearance of new colours – adds to the overall effect.

You certainly need to keep on the move and

your finger on the trigger as an endless stream of foot soldiers bears down on you. Luckily, your machine gun makes short work of them. The trucks and helicopter gunships are far more robust, and consequently much more dangerous. The latter home in on you, dropping bombs all the time. The trucks drive at you while the occupants lob grenades.

You must shoot both the helicopters and trucks several times before they burst into flames, but the danger does not stop there – you now have to contend with an armed and understandably furious pilot or driver charging you on foot. Contact with anything that moves is fatal.

Some useful bonuses are on offer if you can get to them: Killing certain foot soldiers lets you retrieve their backpacks. Collect them to find a machine gun, extra lives, temporary invulnerability and so on.

The game features some nice touches – the keys can be redefined and the colour schemes altered to make viewing easier if you are using a black and white TV or monochrome monitor. The

## Second Opinion

AT first I thought this was much too hard – just one hit by a stray bullet and you bite the dust. However, with practice I soon got the hang of it and was addicted in no time at all. If you're after a good blast you can't go far wrong with this little beauty.

Janice Murray

# Reaching new levels



I ALWAYS think that playability is the most important virtue of any game. The sound may be poor and the graphics crude, but if it's playable I'll keep coming back for more.

Also, with a few notable exceptions such as Elite, simple ideas often make the best games. Breakthrough from Audiogenic is one game that can be described in this way.

Although the title makes it sound like another Breakout bat-and-ball clone, Breakthrough is totally different. It is basically a 100-screen platform game in which you are a little wizard. Navigate your way around each screen avoiding the fireballs, vampire bats and various other nasties, collect a key and make your way to a door. It's simple – or is it?

The controls are certainly easy to use: Left,

Product: *Breakthrough*  
Price: £9.95  
Supplier: ASL, Winchester House, Canning Road,  
Wealdstone, Harrow HA3 7SJ.  
Tel: 01-861 1166

right, jump and create/destroy a block. It's this last feature that holds the key to the whole game. By destroying existing blocks and creating new ones you can change the shape of the screen by making doorways and staircases in which to gain access to unreachable nooks and crannies.

Certain types of block can't be destroyed and these are invariably positioned awkwardly just to make things difficult. When used in conjunction with fireballs and the other nasties they can produce some very tricky screens. However, there are certain compensations: Some blocks contain hidden goodies that can give you bonus

# BLASTING

pause/restart, quit, and sound on/off options are all present and correct.

One drawback lets the game down, and that's the lack of accuracy when detecting collisions. Many a time I have sidestepped an enemy soldier or seen a bomb land well short of me only to find myself disappearing in a puff of red smoke. It is an irritating flaw in an otherwise highly enjoyable game. However, you do get used to it and it's not that much of a problem – just give everything a fairly wide berth.

The screen display is excellent and the Mode 2 – unusual for the Electron – multicolour graphics are well defined, although there is a strip of garbage along the bottom of the screen like Superior's Citadel and one or two other games. You won't notice it after a while.

The speed is excellent too, making it a fast-paced and exciting game to play. There's no music, but the sound effects are reasonably good with a rat-a-tat when you fire your gun, and a whaaaa... when a bomb or grenade heads your way.

Shark is a simple and bracing shoot-anything-that-moves-before-it-gets-you type of game. Colonel Sharkey will certainly win his share of devotees, especially among those seeking a hero to inherit the mantle of Commander Striker.

Martin Reed

Sound .....	8
Graphics .....	10
Playability .....	10
Value for money .....	9
Overall .....	9

points, extra lives, or half the speed of the countdown timer. Very useful.

The 100 screens are not linked, as in an arcade adventure. They are separate, but in order of difficulty, and a useful screen skipping facility is provided so you don't have to start at the beginning each time. Every five screens you are given a new password which can be used to skip screens you have already mastered.

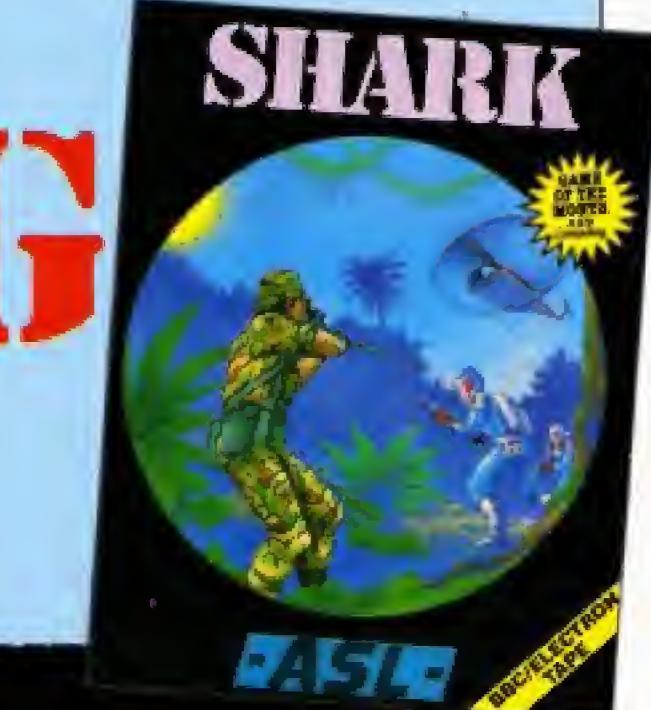
This is certainly an engrossing game, and is extremely addictive because of its simplicity. The



graphics are rather small compared to those used in many other games on the market these days, and there is a strip of garbage across the top of the screen, but don't let that put you off – it's a great game.

There isn't any sound to speak of, just the odd effect here and there, and it runs fairly slowly, but this isn't a problem. In fact it positively helps, as I found it unplayable with my Slogger Turbo switched on.

Breakthrough is not too hard and strikes me as



being an effective way to encourage children to think logically – there are certainly enough puzzles to ponder. If you are after something a little out of the ordinary, this could be right up your street.

Martin Reed

Sound .....	3
Graphics .....	7
Playability .....	9
Value for money .....	8
Overall .....	8

## Second Opinion

THIS is great for puzzle fanatics. The graphics are good and the screens are well thought out. The first presented no problems and took all of five minutes, but they get progressively more difficult. It's nice to play a non-violent game for a change. I think I'll just have one more go and see if I can crack screen 11.

Janice Murray



The loading screen



Try to reach the key in the corner

Program: Plane Crash  
Price: £3.95  
Supplier: Labyrinth Software, 22 Nelson Street,  
Retford, Nottinghamshire DN22 6LP  
Tel: 0777 701669

**P**LANE Crash is the first release from this new software house dedicated to producing top rate adventures for the Electron and BBC Micro. In this three-part undertaking you have the misfortune to play the only survivor of a plane which crashed in a jungle. Your task is to first escape from the wreckage and then survive the rigours of your environment.

The brutal beginning may have a few adventurers squirming – you find yourself trapped in your seat viewing the severed head of the air stewardess. You have to extricate yourself from your jammed seat belt before flames and smoke engulf you.

At this point a move counter is operating, so actions must be decisive. Life is never easy and you will need to have a knowledge of schoolboy

# Jungle struggle

Latin or a good English dictionary if you are to be successful.

Once free you must explore the cabin thoroughly and act quickly to avoid suffocation. The fire extinguisher must be saved as it will prove invaluable on more than one other occasion.

I have come across few adventures with as difficult a beginning as Plane Crash. Any mistake seems to result in an early transportation from the game to that great silicon paradise in the sky. Such difficulties may deter some beginners to adventuring, especially as Labyrinth discourages the user from asking for help.

As the game progresses you should LOOK at every opportunity and examine all you come across. In turn, open and look inside any artifacts, such as the box and the survival kit. Do not shy away from looting corpses – there are some weird studies in bad taste. The program does not recognise the word SEARCH, which I found irritating.

There are a few other annoyances which should have been ironed out by a team of play testers. On occasions flags are poorly set within the game and this leads to unnecessary frustration. For example, try taking the bag before

## Second Opinion

Adventure games aren't really my cup of tea. However, fans will find this an interesting fantasy. There are puzzles galore designed to give the old grey matter a thorough workout, and lots of atmospheric descriptions. The one or two minor bugs, don't really spoil the adventure, so it's worth a try.

Janice Murray

# Above par simulation

Product: Golf  
Price: £1.99  
Supplier: Blue Ribbon, CDS House, Beckett Road,  
Doncaster DN2 4AD.  
Tel: 0302 21134



On the green

**G**OLF is another of those popular spectator sports which occupy vast amounts of television time, and it's a game which you either love or hate. This simulation, brought to you by Blue Ribbon, is one of the better attempts I have seen at converting this fascinating game of skill to the micro.

The loading screen is simple, in typical Blue Ribbon fashion. The game loads reasonably soon after and the first thing you see is the leaderboard with the top five rounds.

The current hole is graphically depicted from overhead giving you a bird's eye view of the action. The fairway, rough, green, trees, bunkers and water hazards are all shown. A flag marks the

hole and the tee. Additional information provided is the distance to the green, the par for the hole and the wind direction.

First you select your club from a bag containing four woods, nine irons and a sand wedge. There's no indication of how far these will carry the ball, so the first few holes will be down to trial and error.

After selecting your club you are required to enter the direction and power of the shot. The direction is shown as a pointer which you can rotate left and right using Z and X, while the power is increased and decreased with the up and down cursor keys. Return hits the ball. You are told where it landed – on the fairway, in the



A bird's eye view of the hole

you have LOOKed.

I have long groaned at having to type GO DOOR in order to progress in an adventure. I also found the absence of the facility to GET or DROP EVERYTHING hampered progress unnecessarily. However, the storyline is well constructed, the problems are difficult but logical and screen response is very fast.

I loved the clever addition of having to monitor your blood sugar count, which was essential to survival. Eat and drink at every opportunity, don't relax, and providing you can endure the blackness of the jungle night you will be well on the way to success.

Despite my reservations, I enjoyed this adventure and will await the next Labyrinth game with interest.

Pendragon

Presentation	7
Atmosphere	7
Frustration factor	10
Value for money	8
Overall	7

rough, water and so on. You are prompted for more shots until you are on the green.

The screen then clears and you are presented with a magnified view of the green showing the hole and your ball. Additionally you are told whether the green is fast or slow so you can adjust the power of your shot accordingly. The club, a putter, is chosen automatically.

When you've finally holed the putt your score card is shown. Here you can see each hole played, how many shots you took, the par for the hole and distance. Also your overall score is displayed. Then it's on to the next hole, and so it continues for the rest of the course.

The graphics are reasonably good and the gameplay is interesting enough to prevent the game from becoming too tedious. The only feature I would have liked to see is a multi-player option, or a two player game at least.

I quite liked this simulation, though if you're not a golf fanatic it may not hold the same appeal. As a budget buy it can't be bad.

Roland Waddilove

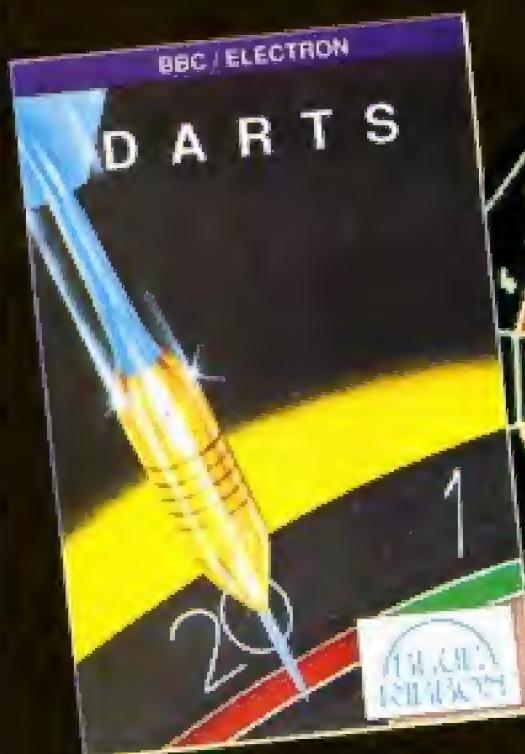
Sound	4
Graphics	7
Playability	7
Value for money	8
Overall	7

## Second Opinion

Budding golf stars will love this simulation of that classic game. Everything has been well thought out, including water and sand hazards, trees and bushes and strong cross winds. A multi-player function is sadly missing, but even as a one player game it is quite a challenge, and it's a game that won't break the bank either.

Janice Murray

# One hundred and eighty!



You are throwing a dart into each number, followed by a double, then inner bull. You can make it harder by specifying that the doubles or trebles only must be hit.

The third game, my favourite, is cricket. Each player takes it in turn to throw as usual, but this time one is batting and the other bowling. The batter scores as many as possible, while the bowler tries for an outer or inner bull. The outer counts as one wicket, and the inner three.

The innings is over when 10 or more wickets have fallen; the players then swap batting and bowling. The winner is the one with the most runs.

The graphics are simple, with a board shown head on with the darts as crosses. The throwing action is again simply executed with a randomly moving dart which you can control to some degree by four keys. Throwing just fixes the dart at its current position. There's no sound to speak of, just a few notes played when you win the game.

For a budget title it's OK, but nothing to write home about. I found it quite interesting at first, but it soon became tedious, despite the three different games.

Roland Waddilove

Sound	3
Graphics	6
Playability	6
Value for money	7
Overall	6

## Second Opinion

I love pub games like darts, and this offering from Blue Ribbon is a good simulation – though not quite up to the standard of Tynesoft's Indoor Sports. The graphics are good, and the variety of games played on the dartboard adds interest to what might otherwise be a dull simulation. At a budget price you can't complain.

Janice Murray

# Don't get your variables in a twist

**Roland Waddilove shows how to keep track of your variables in Part II of his guide to the Electron's Basic rom**

**T**HE Electron's Basic rom contains hundreds of useful subroutines which the machine code programmer can use in his own programs. In this series of articles I'll be documenting a few of them, and showing how they may be incorporated in your own listings.

Some routines have immediately obvious uses, others not. However, it is interesting to see how BBC Basic goes about its business, and having a more thorough knowledge of what goes on under the lid of your micro will enable you to use it more efficiently.

Last month we examined the routines Basic uses when listing programs in memory, and developed one of our own. Now we'll take a brief look at variables, see how Basic creates them, and later find where they are stored when it wants to access them.

Basic stores any variables that a program uses on a structure called the heap, an area of memory starting at LOMEM. When a program is run and before any variables have been defined, the heap is empty and the top of this section of memory – pointed to by memory locations &02/&03 – is at the same address as the end – LOMEM, pointed to by locations &00/&01. If Basic encounters a numeric variable defined within the program it is running it stores its name and value on the top of

the heap and moves its heap pointer up to the next free location, ready for the next variable. So the heap grows upwards in memory starting at LOMEM.

When Basic comes across a line like:

**PRINT length \* 2**

it must search for the variable *length* so that it can multiply it by two and print out the result.

If Basic had to look through every item on the heap for a variable with the name *length* it would take quite a long time, and programs would be

slowed down drastically by large numbers of variables. Foreseeing this problem, the author of BBC Basic, Roger Wilson, has implemented a linked list structure for the variable heap. What this means is that the variables are linked like chains, and to find a particular variable Basic looks along the links of a particular chain until it finds it.

Part of page four – &400 – in memory is dedicated to this linked list. It works like this: If Basic encounters a variable whose name starts with the letter A it puts the name and value on the

Routine	Input parameters	Output parameters
fncvra=&9582 find/create variable	PTRA points to variable name	Z=0 – variable found Z=1 – variable not found so new one created
schvar=&9479 search for variable	&37/&38 points to one before name &39= length	Z=1 – variable not found Z=0 – &2A/&2B points to variable value

The rom routines used

## Resident integer variables

Using the heap as a scratchpad to store variables does not apply to any of the resident integer variables A%~Z% and @%. Basic has set aside a block of memory starting at &400 for these permanently defined variables. This makes them easy to find, since Basic already knows where they are located and doesn't waste time searching the heap for them. As their location is already known, they can be accessed much faster than ordinary numeric variables. Also maths operations using them are much quicker because integer maths is so quick and easy to perform.

stack and stores its address at &482/&483. If it then comes across another variable starting with the letter A it again stores its name and number on the stack, but in addition, stores its address with the first variable it found.

So the memory location &482/&483 holds the address of the first variable beginning with the letter A – or zero if there aren't any – and this variable holds the address of the next variable starting with A, which stores the next and so on. The same thing happens with the variables starting with B, and C and so on. Their addresses are stored at &484/&485, &486/&487 and so on.

As you can see, a linked list or chain of variables is formed, with each one pointing to the next starting with the same letter. If a pointer is zero there aren't any more variables starting with that letter.

To find the start of a chain, Basic takes the ASCII value of the letter, doubles it and adds &400. So if it wants to find the value of the variable width it gets the pointer to the variable chain starting with the letter w at &400+2\*ASCII'w' and follows the w chain.

A side effect of this is that if we use variables starting with a different letter of the alphabet in our programs, Basic will instantly be able to find their location and access them much quicker than would normally be possible. Even if two or three variables start with the same initial letter there

will still only be two or three variables to search through.

One thing I haven't mentioned, is that Basic doesn't store the first letter of the variable name – it doesn't need to as each variable is in a linked list and they all start with the same letter.

Program I is a short procedure which will print out the names of all the variables defined within a program. To use it in your own programs add the procedure PROCprint\_variables to the end of your listing. After running your program enter:

### PROCPrint\_variables

Program II shows how Basic searches for a variable, and makes use of a subroutine called schvar at &9469. When calling this, set &37/&38 to one before the start of the variable name and set &39 to the length. On return, if the zero flag is clear then &2A/&2B points to the address of its value.

In this example we are searching for the variable called temp%, which is stored in line 220. When found – it's defined in the program in line 40 – its address and value are printed. Try changing the variable searched for in line 220 to fred and confirm that a Not found error message is printed.

Program III is a slight variation on the last one,

```

10 REM Print Variables by
20 REM scanning linked list
30
40 PROCprint_variables
50 END
60
9000 DEF PROCPrint_variables
9010 FOR letter=ASC'A' TO ASC'z'
9020 link=&400+letter*2
9030 Link!=Link AND &FFFF
9040 IF Link<256 GOTO 9100
9050 VDU Letter
9060 temp=link+2
9070 IF temp VDU ?temp:temp=temp+1:G
OTO 9070
9080 PRINT
9090 GOTO 9030
9100 NEXT
9110 ENDPROC

```

Program I

and this time, if after searching for a variable it is not found, a new one is created and its value set to zero.

It uses a subroutine called fncvra at &9582 which searches for the variable at PTRA. If found it it will return with the zero flag clear, PTRA pointing to the character after the name, and INTA holding the variable descriptor block. The first two bytes hold the address of the value and the third holds the variable type. If the variable isn't found a new one is created on the heap and its value is set to zero.

● Next month I'll be looking at some more useful Basic rom routines and taking Basic apart to see what makes it tick.

```

10 REM Search for variable
20 REM By R.A.Waddilove
30 REM (c) Electron User
40 temp%=&70
50 schvar=&9469
60 FOR i=0 TO 2 STEP 2
70 PI=&1980
80 C OPT i
90 LDA #ivar-1)MOD 256
100 STA 837
110 LDA #ivar-1)DIV 256
120 STA 838
130 LDA #len-var
140 STA 839
150 JSR schvar
160 BEQ not_found
170 LDA &2A:STA &70
180 LDA &2B:STA &71
190 RTS
200
210 .var
220 EQUUS 'temp'
230 .len
240
250 .not_found
260 BRK
270 EQUUS 0
280 EQUUS 'Not found'
290 BRK
300 J
310 NEXT
320 CALL &9000
330 PRINT 'Address=';(&70 AND &FFFF)
340 PRINT 'Value=';((&70 AND &FFFF)

```

Program II

```

10 REM Find/create variable
20 REM By R.A.Waddilove
30 REM (c) Electron User
40 osascii=&FFE3
50 fncvra=&95C9
60 PTRA=&8B
70 PTRAINDEX=&A
80 PTRB=&19
90 PTRBINDEX=&1B
100 FOR i=0 TO 2 STEP 2
110 PI=&9800
120 COPT i
130 LDA PTRA:PHA
140 LDA PTRA+1:PHA
150 LDA PTRAINDEX:PHA
160 LDA PTRB:PHA
170 LDA PTRB+1:PHA
180 LDA PTRBINDEX:PHA
190
200 LDA #var MOD 256
210 STA PTRA
220 LDA #var DIV 256
230 STA PTRA+1

```

Program III

```

240 LDY #0
250 STY PTRAINDEX
260 JSR fncvra
270 BEQ new
280 JSR print
290 EQUUS 'Variable exists'
300 EQUW 13
310 JMP exit
320 .new
330 JSR print
340 EQUUS 'New variable'
350 EQUW 13
360
370 .exit
380 PLA:STA PTRBINDEX
390 PLA:STA PTRB+1
400 PLA:STA PTRB
410 PLA:STA PTRAINDEX
420 PLA:STA PTRA+1
430 PLA:STA PTRA
440 RTS
450
460 .print
470 PLA:STA &70
480 PLA:STA &71
490 LDY #0
500 BEQ here
510 .loop
520 LDA (&70),Y
530 BEQ end_print
540 JSR osascii
550 .here
560 INC &70:BNE loop
570 INC &71:BNE loop
580 .end_print
590 LDA &71:PHA
600 LDA &70:PHA
610 RTS
620
630 .var
640 EQUUS 'Total='
650 J
660 NEXT
670 CALL &9000

```

ACCESS &amp; VISA

HOTLINE

TEL: JACQUI  
0625 528885

MAIL ORDER ONLY



# 21st. Software

## PRESENTS

### A SELECTION OF HARDWARE, UTILITIES & SOFTWARE FOR THE ELECTRON

**COMPILATION TAPES:**

5 Star Games vol. 3 .....	7.25
Computer Hits 4 .....	7.25
Play it Again Sam .....	7.25
Play it Again Sam II .....	7.25
Super Hits vol. III .....	7.25
Micro Value Gold .....	3.50
Micro Value .....	3.50

**NEW RELEASES:**

Summer Olympiad .....	7.50
Repton Thru Time .....	5.50
Shark .....	7.50
Breakthrough .....	7.50
Barbarian .....	7.50
Pipeline .....	7.75
Saigon .....	7.50
Play It Again Sam III .....	7.50

Incentives Adventure Creator .....	6.50
------------------------------------	------

First Byte Joystick Interfaces (includes conversion tape) .....	15.95
--	-------

**UNDER A FIVER:**

Nightmare Maze .....	1.99	Savage Pond .....	2.95	Wychwood .....	3.65
Castle Assault .....	1.99	Skyhawk .....	2.99	The Nine Dancers .....	3.65
Astro Plumber .....	1.99	Ice Hockey .....	2.99	Jet Power Jack .....	2.75
Diamond Mine .....	1.99	Hunky Dory .....	2.99	Positron .....	2.75
Diamond Mine II .....	1.99	Plan B .....	2.99	Swag .....	2.75
Darts .....	1.99	Dunjunz .....	2.99	Gauntlet .....	2.75
Joey .....	1.99	Squeakaliser .....	2.99	Chess .....	2.75
Ravage .....	1.99	Templeton .....	2.99	Killer Gorilla .....	2.75
Bar Billiards .....	1.99	Plan B II .....	2.99	U.X.B. .....	2.75
Condition Red .....	1.99	Mini Office .....	4.95	Felix/Evil Weevils .....	2.75
Twin Kingdom Valley .....	2.99	Micro Olympics .....	4.95	Felix in Factory .....	2.75
Starforce 7 .....	2.99	Heathrow A.T.C. .....	3.50	Felix/Fruit Monsters .....	2.75
Tennis .....	2.99	Hex .....	3.65	Stock Car .....	2.75
Cricket .....	2.95	Puppet Man .....	3.65	Rubble Trouble .....	2.75
Jack Atac .....	2.95	The Rising of Salandra .....	4.55	Bumble Bee .....	2.75
				Steve Davis .....	1.99

**PRES:**

Advanced Plus 2 .....	11.50
Advanced Plus 6 .....	35.95
Plus 1 .....	47.95
Advanced Battery Backed Ram .....	37.99
Advanced +3 .....	110.00

Birdie Barrage .....	6.95
Colossus Chess IV .....	8.45
Brian Clough's Fortunes .....	12.95
Star Wars .....	7.95
Paperboy .....	7.75
The Lost Crystal .....	10.50
The Wheel of Fortune .....	7.45
Castle Frankenstein .....	5.95
The Quest of the Holy Grail .....	5.95
Kingdom of Klein .....	5.95
Evening Star .....	7.95
Graham Gooch Test Cricket .....	7.75
Ziggy .....	6.75
Electron Power Pack II .....	7.95
Ransack .....	7.95
Despatch Rider .....	7.25
French Mistress A or B .....	7.95
German Master A or B .....	7.95
Spanish Tutor A or B .....	7.95
Italian A or B .....	7.95
Answer Back Jun. or Sen. .....	8.95
Answer Back Sport .....	8.95
Identify Europe .....	6.95
Arithmetic (6-11 years) .....	4.25
Spelling (8-12 years) .....	4.25
Spycat .....	7.75
Around World 40 Screens .....	5.95
Strykers Run .....	7.75
Codename Droid .....	7.75
Crazy Rider .....	7.75
Palace of Magic .....	7.75
Play it Again Sam .....	7.75
Elixir .....	7.95
Spellbinder .....	7.95
Life of Repton .....	5.95
Bonecruncher .....	7.95

Winter Olympiad 88 .....	7.50
Indoor Games .....	7.95
Boulderdash .....	7.95
Micro Value Gold .....	3.99
Spy v Spy .....	7.75
Oxbridge .....	6.75
Phantom .....	6.75
Microvalue .....	3.49
The Big K.O. .....	6.75
Futureshock .....	6.75
Jet Set Willie II .....	6.75
Goal .....	6.75
Commonwealth Games .....	6.50
US Drag Racing .....	5.95
Jet Set Willy .....	6.50
Tynesoft Starter Pack I .....	6.50
Ian Botham Test .....	6.50
Icarus .....	7.75
Natural History (10+) .....	4.25
English Words (12+) .....	4.25
First Aid (12+) .....	4.25
General Science (14+) .....	4.25
Know England (12+) .....	4.25
Know Scotland (12+) .....	4.25
Supersport (14+) .....	4.25
20th Century History (12+) .....	4.25
Association Football (14+) .....	4.25
Tetris .....	7.25
Spitfire 40 .....	7.95
Harrier Strike Force .....	7.95
Rick Hanson .....	7.75
Project Thesius .....	7.75
Myorem .....	7.75
The Hunt .....	7.95
Village of Lost Souls .....	7.95
Supergolf .....	6.50

Trafalgar .....	7.00
Cashcare .....	10.65
VAT Care .....	13.65
Building Society Care .....	8.95
Investment Care .....	12.95
TV Director .....	11.65
Squirrels Nuts Pack .....	7.95
Repton 3 .....	7.75

**PLUS 3 DISCS**

BLUE RIBBON: Games Disc 1 .....	8.95
------------------------------------	------

C.D.S.: Steve Davis .....	8.95
Birdie Barrage .....	8.95

**KOSMOS SOFTWARE:**

French A&B .....	18.65
German A&B .....	18.65
Italian A&B .....	18.65
Spanish A&B .....	18.65
Ans. Back Sen. .....	11.65
Ans. Back Jun. .....	11.65
Ans. Back Sport .....	11.65
Any Factfile .....	7.45

**SUPERIOR SOFTWARE:**

Superior Hits III .....	12.75
Codename Droid .....	12.75
Crazee Rider .....	12.75
Palace of Magic .....	12.75
Play it Again Sam .....	12.75
Elixir .....	12.75

BOX OF TEN C64 COMPUTER CASSETTES £4.99 inc VAT &amp; P&amp;P

EDUCATIONAL & GOVERNMENT ORDERS WELCOME  
ALL PRICES ARE INCLUSIVE OF VAT AND CARRIAGE  
OVERSEAS ORDERS PLEASE ADD £1.00 PER ITEM, INCLUDES INSURANCEPlease send me: Cass  Plus 3 Disc 1. \_\_\_\_\_ £ \_\_\_\_\_  
2. \_\_\_\_\_ £ \_\_\_\_\_  
3. \_\_\_\_\_ £ \_\_\_\_\_  
4. \_\_\_\_\_ £ \_\_\_\_\_  
TOTAL £ \_\_\_\_\_

Please make cheques payable to:

21st Software Ltd

Access No.

Visa, Mastercard, Eurocard

Card holders name \_\_\_\_\_

Send Orders to:

21st SOFTWARE LTD. Dept EU

15 Bridgefield Avenue, Wilmslow SK9 2JS

Tel: Wilmslow (0625) 528885

Name \_\_\_\_\_

Address \_\_\_\_\_

Post Code \_\_\_\_\_

Tel. No (STD) \_\_\_\_\_

# MUSIC AT YOUR Fingertips

£500  
in prizes to be won



Here's your opportunity to enhance your Electron to make beautiful music - with the new Music 5000 for the Acorn Electron courtesy of Hybrid Technology and Pres. Now you can turn your Electron into the centre of a digital synthesiser complete with programmable instruments, a computerised mixing desk, stave editor and its own Music Composition language.

## FIRST PRIZE

Music 5000 from Hybrid  
Technology worth over

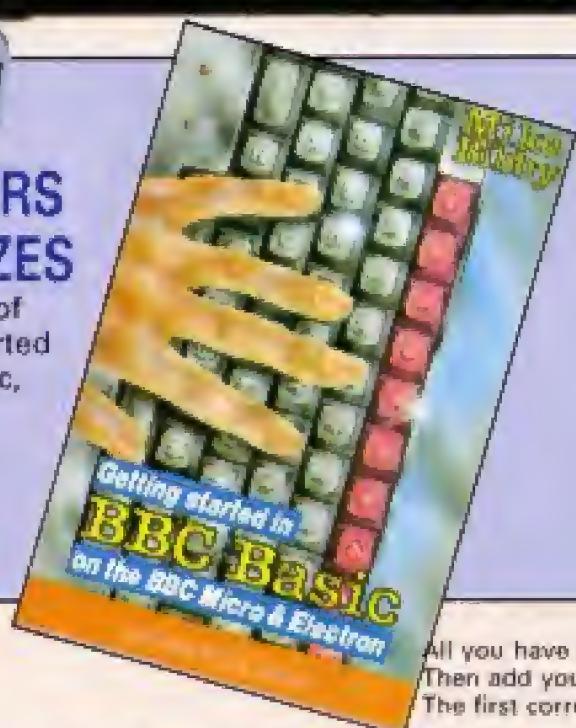
£100



HYBRID

## RUNNERS UP PRIZES

100 copies of  
Getting Started  
in BBC Basic,  
worth  
£3.99 each



## SECOND PRIZE

Win one of 10  
cuddly Teenage  
Reptons to help  
you when you play  
Repton Thru Time

## WORD PUZZLE

Circle the musical terms  
hidden in this puzzle and send  
it to us. The first person out of  
the sack to find all the words  
will win the top prize.

S T R A U S S S H G  
T R B D N R T S T Q  
H A Q Q S A R K B U  
A H U Q V T E O A A  
D Y L E B T B M O V  
Y N W H A S L Y D E  
N V Z W N G E D R R  
F L R C U Z O O N Q  
M M I N I M M D D O  
V F F S F C L E F F

## ENTRY FORM

Name .....

Address .....

..... Postcode .....

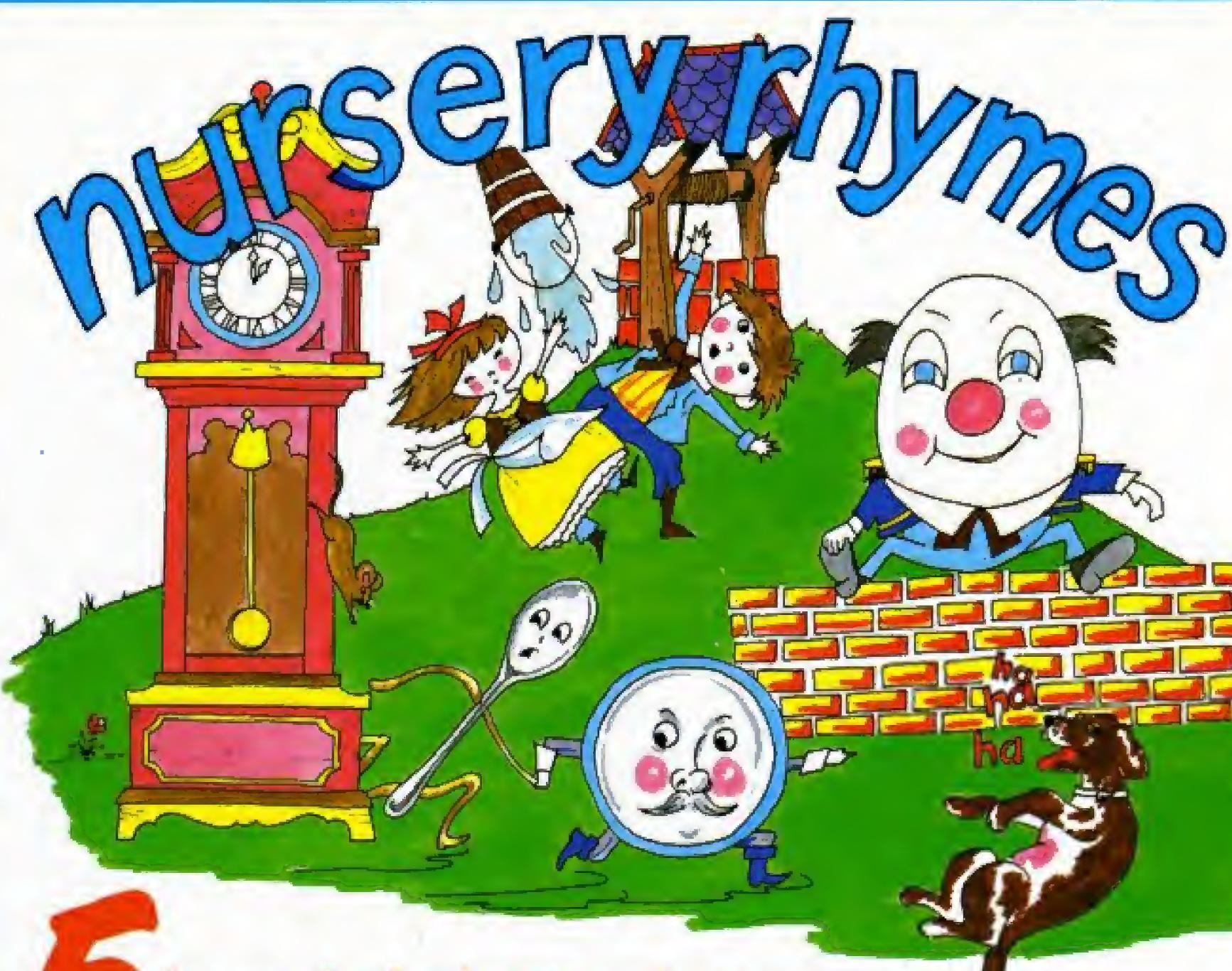
Send to Music 5000 Competition, Electron User, Europa House,  
Adlington Park, Adlington, Macclesfield SK10 4NP.

electron  
user

MAIL ORDER OFFERS

electron  
user

MAIL ORDER OFFERS



**5** fun-packed educational programs  
... for young children everywhere



This delightful collection of programs is based around children's favourite Nursery Rhymes. There's plenty of sparkling colour, sound and captivating animation to keep them riveted – and as they play they'll be learning all the way.

- ★ Tell the time with Hickory Dickory Dock.
- ★ Assemble the jigsaw in Humpty Dumpty.
- ★ Learn to spell with Jack and Jill.
- ★ Match the animals in See Saw Marjory Daw.
- ★ Play an exciting game in Hey Diddle Diddle.

Children from two to nine will be entertained for hours with these interactive programs. Don't miss out on this beautiful gift for your family – and at a very special price.

**ONLY £5.95 (cassette)**  
**£6.95 (3½" disc)**

Suitable for any Acorn Electron

**TO ORDER PLEASE USE THE FORM ON PAGE 45**

# Do you feel lucky, punk?

**L**OAD your Electron and try your hand at pistol shooting. This fast-action game will sharpen your reflexes and get your adrenalin flowing and your heart pumping.

The top half of the screen contains six targets, edge-on so they can't be seen. At random intervals one will swing round and you must quickly move your sights to it, position them carefully and fire your gun. If you are too slow the target will swing back and you'll lose your shot.

There are 10 targets in all and the bottom left-hand corner of the screen shows a greatly magnified picture of one. On this is recorded where each bullet hits. The outer white ring is worth 20

**David Taylor's game for budding marksmen will provide the answer**

points, the middle yellow ring 50 points, the inner red 80 and if you hit the target dead centre you'll chalk up 100 points.

The score for each individual shot is displayed in the bottom right-hand corner of the screen, along with the number of targets remaining. A running total of your score is shown in the



middle, just above the current high score. You can use a Plus 1 and analogue joystick or the keys Z, X, \* and ? for up down left and right, plus Return for fire.

How good is your aim? Are your reactions fast enough? Find out by playing Pistol Shooting.

```

10 REM PISTOL SHOOTING
20 REM By David Taylor
30 REM By (c) Electron User
40 MODE5
50 VDU23,224,0,4,4,4,31,4,4,4
60 VDU23,225,1,1,7,7,15,15,30,30
70 VDU23,226,192,192,240,240,248,24
8,60,60
80 VDU23,227,60,56,56,56,112,112,11
2,112
90 VDU23,228,30,14,14,14,7,7,7,7
100 VDU23,229,112,112,56,56,56,60,30
,30
110 VDU23,230,7,7,14,14,14,30,60,60
120 VDU23,231,15,15,7,7,1,1,0,0
130 VDU23,232,248,248,240,240,192,19
2,0,0
140 VDU23,233,0,0,56,56,124,254,254,
254
150 VDU23,234,15,14,14,14,14,15,7,7
160 VDU23,235,120,56,56,56,56,120,24
0,240
170 VDU23,236,254,124,56,56,0,0,0,0
180 VDU23,237,0,0,0,5,5,2,5,5
190 VDU23,238,80,80,136,136,80,80,32
,32
200 VDU23,239,0,0,0,0,0,0,32,32
210 VDU23,240,32,32,80,80,32,32,0,0
220 VDU23,241,0,0,32,32,0,0,0,0
230 VDU23,242,248,248,248,248,248,24
8,248,248
240 VDU23,243,0,0,0,258,74,78,74,74
250 VDU23,244,0,0,0,238,168,232,202,
174
260 VDU23,245,0,0,0,238,132,228,132,
228
270 VDU23,246,0,0,0,224,128,224,32,2
24
280 VDU23,247,0,0,0,142,136,142,136,
238
290 VDU23,248,0,0,0,238,132,228,132,
132
300 VDU23,249,0,0,0,234,138,238,42,2
34
310 VDU23,250,0,0,0,238,164,164,164,
228
320 VDU23,251,0,0,0,238,168,238,200,
174
330 VDU23,1,0,0,0,0,0,0,0,0:HSX=700:HS=

```

```

700:LN=100:DIMNMS(10):RESTORE1690:F
ORAL=STD5:READNMS(A1):NEXTAX
340 VDU4:PROCintri:COLOUR128:CLS
350 VDU23,252,0,0,0,234,132,234,42,2
38
360 VDU23,253,0,0,0,142,132,132,228
370 ENVELOPE1,131,0,0,0,0,0,126,-3
,0,0,126,0
380 SS=$0000:SI$=$000
390 IF $X>HSX HSX=$X:HS$=STR$(HSX):L
I=LEN(HS$):HS=STRINGS(4-LI,"0")+HS$
400 SY=0:ED=0
410 PROCScreen
420 FX=0:HZ=0:XY=$92:TY=504:S=0
430 IF ED=1 ED=0:MSG$="GAME OVER":FO
RA=0 TO 500:NEXTA:FOR AX=1 TO 9:MOVE28
B+(64*AX),800:PROCbig(MIDS(MSG$,AX,1))
:SOUND1,-15,45-(AX*5),2:FORB=BT0150:NE
XTB:NEXTA:FORA=BT05000:NEXTA:GOT0340
440 VDU5:PROCTarget(1)
450 IF M$=1 PROCDJoy:GOTO 530
460 IF INKEY=98 XX=XX-8
470 IF INKEY=67 XX=XX+8
480 IF INKEY=73 YY=YY+8
490 IF INKEY=105 YY=YY-8
500 MOVEXX,TY:PRINTCHR$(224)
510 IF FX=1 THEN 530
520 IF INKEY=74 FX=1:PROCFire
530 IF TIME>=350 PROCTarget(2):GOT0
420
540 MOVEXX,YY:PRINTCHR$(224)
550 IF XX>=1192 XX=1192
560 IF XX<=0 XX=0
570 IF YY>=1000 YY=1000
580 IF YY<=-488 YY=-488
590 GOTO 450
600 END
610 DEFPROCscreen
620 GCOLD,129:FOR AX=1 TO 6:VDU24,(A
X*200)-80,598;((AX*200)+16)-80,918;;CL
G:NEXT AX
630 VDU24,90;568;1168;598;;CLG:VDU24
,0,0,440,440;;CLG:VDU26
640 GCOLD,3:MOVED,0:DRAW1279,0:DRAW1
279,1023:DRAW0,1023:DRAW0,0:MOVE440,0:
DRAW440,440:MOVED,440:DRAW1279,440:MOV
E440,220:DRAW976,220:MOVE976,0:DRAW976
,440

```

```

650 VDU5:MOVE552,400:GCOLD,2:PROCBIG
("SCORE"):MOVE584,312:GCOLD,3:PROCBIG(
$5):MOVE456,T84:GCOLD,2:PROCBIG("HI-SC
ORE"):MOVE588,88:GCOLD,3:PROCBIG(HS)
660 GCOLD,2:MOVE1064,432:PRINTCHR$24
9;CHR$250:MOVE1032,392:PRINTCHR$251;CH
R$252:CHR$253
670 GCOLD,3:FOR AX=0 TO 16 STEP 8:MD
VE984+(AX*2),256+AX:DRAW1271-(AX*2),25
6+AX:DRAW1271-(AX*2),344+AX:DRAW984+(A
X*2),344+AX:DRAW984+(AX*2),256+AX:NEXT
AX:GCOLD,2:MOVE1032,312:PRINTS1$
680 MOVE1016,244:PRINTCHR$243;CHR$24
4;CHR$245;CHR$246:MOVE1064,204:PRINTCH
R$247;CHR$248
690 UX=136:FOR L=1 TO 2:FOR QX=1000
TO 1224 STEP 56:GCOLD,1:MOVEQX,UX-12:P
RINTCHR$242:MOVEQX,UX+12:PRINTCHR$242:
GCOLD,3:MOVEQX,UX:PRINTCHR$238:MOVEQX,
UX+32:PRINTCHR$239:GCOLD,2:MOVEQX,UX:P
RINTCHR$240:GCOLD,1:MOVEQX,UX
700 PRINTCHR$241:NEXT QX:UT=UX-80:NE
XT L:VDU4:UX=UX+80:QX=QX-56
710 PROCCloseup
720 ENDPROC
730 DEFPROCtarget(PX)
740 IF PX=2 THEN 840
750 IF PX>2 ENDPROC
760 GCOLD,3:MOVEXT,YY:PRINTCHR$(224)
770 TIME=0:REPEAT UNTIL TIME>=100+RN
D($000)
780 EZ=RND(8)
790 GCOLD,1:TIME=0:FOR AX=28 TO 76 S
TEP B:MOVE((EZ*200)-80)+AX,648:DRAW((E
Z*200)-80)+AX,898:MOVE((EZ*200)+16)-A
X-72,648:DRAW(((EZ*200)+16)-AX)-72,89
B:SOUND1,-15,AX*3,1:NEXT AX
800 GCOLD,3:MOVE((EZ*200)-136,848:PR
INTCHR$225;CHR$226:MOVE((EZ*200)-136,816
:PRINTCHR$227;CHR$228:MOVE((EZ*200)-136
,784:PRINTCHR$229;CHR$230:MOVE((EZ*200)
-136,752:PRINTCHR$231;CHR$232
810 GCOLD,2:MOVE((EZ*200)-96,832:PR
INTCHR$233:MOVE((EZ*200)-136,800:PRINTCHR
$234;CHR$235:MOVE((EZ*200)-96,768:PRINT
CHR$236
820 VDU26

```

Turn to Page 25 ►

**Write your own arcade smashes using**

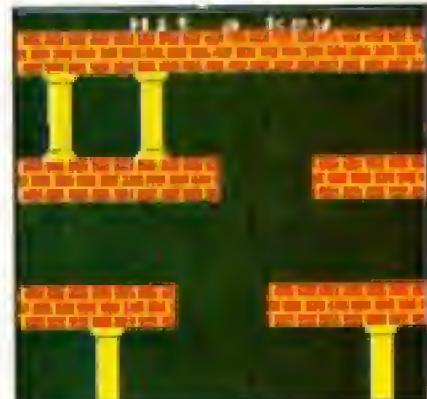
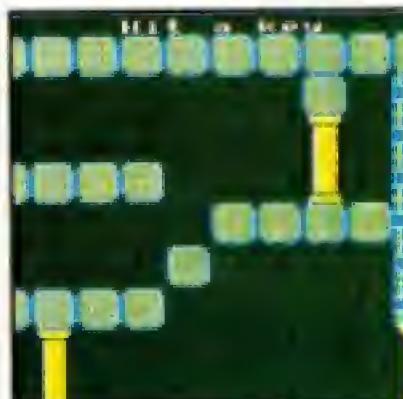
## ARCADE GAME CREATOR

Arcade Game Creator is a suite of programs taken from the pages of *Electron User*. It lets you into the secrets of writing fast-action arcade games, and provides you with a number of utilities to make design and programming easier.

Among the programs are:

- A Mode 5 sprite editor for designing your own multi-coloured characters.
- A selection of fast print routines that will move sprites both in front or behind other objects on the screen.
- Map generators that will squeeze a Mode 5 screen into 8 bytes!
- Scrolling maps.
- Score update and printing routines.
- ... and much, much more.

To accompany the Arcade Game Creator we are also making available the six back issues (February to July 1988) in which the series appeared, in a special bundle for only £8.99 – saving over £1.50. The series of articles is clearly written without any jargon, and takes you step-by-step from the basics of game design, right up to producing fully-fledged programs.



Two simple screens from the series

If you are an aspiring games programmer, this is an offer you simply cannot afford to miss!

Arcade  
Game  
Creator  
Tape £3.95  
Disc £4.95

Six issues of  
*Electron User*  
containing  
details of the  
package  
£8.99

Tape and bundle	£12.94
Disc and bundle	£13.94

**SAVE OVER £1.50**

To place your order, please turn to the form on Page 45

## Two great offers from **electron** *user*

### Get **electron** *user* **FREE** each month

*when you subscribe to our monthly tape or disc*

Incredible but true! For a limited period we are now giving away *Electron User* for a whole year – when you take out a tape or disc subscription. That's worth £15! You'll also be able to choose from the special subscription offer on Page 45 – and save an additional £15.

Each of the monthly tapes and discs is packed with all the fun-filled games and power-packed utilities from the pages of *Electron User*, plus occasional extras which you won't find in the magazine.

Remember, this offer is for a limited period only, so save the wear and tear on your fingers, and ensure you get programs that work the first time, by taking us up on this special offer, today!

*Note: If you don't wish to subscribe to the magazine, you can still take out a tape or disc subscription at a saving of £10! Or, if you are already a subscriber, you may renew your subscription early to take advantage of this exceptional offer.*



**SAVE  
UP TO £31!**

Tape subscription	
Usual price	£35
Special price	£25
YOU SAVE	£10

Tape + magazine subscription	
Usual price	£50
Special price	£35
YOU SAVE	£15

Disc subscription	
Usual price	£50
Special price	£40
YOU SAVE	£10

Disc + magazine subscription	
Usual price	£65
Special price	£50
YOU SAVE	£15

Place your order TODAY, using the form on Page 45

CONTROLS	
Z	Left
X	Right
*	Up
?	Down
Return	Fire
Or	Joystick

#### From Page 23

```

830 VDU24,1040;288;1204;312;;GCOLB,1
28;;CLG:VDU26:GCOLB,2:MOVE1032,312:PRIN
T'000':GCOL3,3:MOVEXX,YX:PRINTCHR$224:
ENDPROC

840 GCOL3,3:MOVEXX,YX:PRINTCHR$224:G
COLB,0:FOR AX=76 TO 28 STEP -8:MOVE((E
X*200)-80)+AX,648:DRAW(1EX*200)-80)+AX
,898:MOVE(((EX*200)+16)-AX)-72,648:DRA
W(((EX*200)+16)-AX)-72,898:SOUND1,-15,
AX+3,1:NEXT AX
850 GCOLB,129:VDU24,(E1*200)-80;580;
((EX*200)+16)-80;870;;CLG:VDU26:FX=0
860 ED=0:GCOLB,0:MOVE81,01+12:PRINTC
HR$242:MOVE82,01+20:PRINTCHR$242:01=02
-56:1F 02=944 UI=UI+80:01=1224:1F 02=2
16 ED=1
870 SC$=STR$(S$):LX=LEN(SC$):SS=STR$
N6$(4-LX,"0")+SC$:VDU24,572;236;856;32
4;;GCOLB,128:CLG:VDU26:GCOLB,3:MOVE584
,312:PROCbigr($$)
880 ENDPROC
890 DEFPROCFire
900 GCOL3,3:MOVEXX,YX:PRINTCHR$(224)
910 SOUND0,1,6,2:H%=0
920 IF XX+40>E1*200-164 AND XX+40<E
*200 AND YX-16>724 AND YX-16<854 THEN
H%=-1
930 C=0:D=0:FOR AX=88 TO 1088 STEP 2
00
940 IF XX>=AX AND XX<=AX+4 C=1
950 IF YX>=804 AND YX<=812 D=1
960 NEXT AX
970 IF C=1 AND D=1 S=100:GOTO 1010
980 IF POINT(XX+40,YX-16)=3 S=20
990 IF POINT(XX+40,YX-16)=2 S=50
1000 IF POINT(XX+40,YX-16)=1 AND XX+4
0>=(E1*200-88) AND XX+40<=(E1*200-56)
AND YX-16>=778 AND YX-16<=810 S=80
1010 S%=$%+5
1020 IF H%=-1 X12=8+(3*(XX+40-(E1*200-
128))):Y12=48+(3*(YX-744)):GCOLB,0:MOV
E12,X12:PRINTCHR$237:GCOL3,2:MOVE12%
,Y12:PRINTCHR$237:FORA=87058:NEXTA:MOVE
X12,Y12:PRINTCHR$237
1030 SC$=STR$(S$):LX=LEN(SC$):SS=STRIN
G$(3-LX,"0")+SC$:VDU24,1040;288;1204;3
12;;GCOLB,128:CLG:VDU26:GCOLB,2:MOVE10
32,312:PRINTSS
1040 GCOL3,3:MOVEXX,YX:PRINTCHR$224
1050 ENDPROC
1060 DEFPROCcloseup

```

#### VARIABLES

S%	Score
HS%	High score
X%	X coordinate of sight
Y%	Y coordinate of sight
NMS	Top five scores

```

1070 CX=3:RX=180:FOR ZX=1 TO 3:GCOLB,
C1
1080 MOVE224+RX,220
1090 FOR AX=0 TO 360 STEP 20
1100 MOVE224,224:PL0T85,224+RX*COS(PI
*AX/180),224+RX*SIN(PI*AX/180)
1110 NEXT AX
1120 RX=RX/2+18:CX=CX-1
1130 IF RX=32 THEN RX=36
1140 NEXT ZX
1150 ENDPROC
1160 DEFPROCbig(A$)
1170 LOCALAZ,XZ,YZ,JZ,KZ
1180 FOR IX=1TOLEN A$:=898=ASC(MID$(A$
,E,I):AI=10:XZ=690:YZ=0:CALL&FFFT:FO
R JZ=0TO1:VDU23,255:FOR CX=2TO9:VDU21898
+4+JZ+KZDIV2):NEXT:VDU255,10,8:NEXT:VD
U11,11,9:NEXT
1190 ENDPROC
1200 DEFPROCintro
1210 COLOUR131:CLS:VDU23,252,255,255,
192,192,223,223,216,216,23,253,216,223
,223,195,195,251,251,27,23,254,27,27,2
51,251,3,3,255,255,19,1,6,0,0,0,19,0,4
,0,0,0,5
1220 GCOLB,0:FOR AX=0 TO 48 STEP 4:MO
VE8+AX,4+AX:DRAW1271-AX,4+AX:DRAW1271-
AX,1019-AX:DRAW8+AX,1019-AX:DRAW8+AX,4
+AX:NEXT AX

```

#### PROCEDURES

Screen	Draw main screen
Target	Open and close target
Fire	Check which part of target hit
closeup	Draw large magnified target
big	Large print routine
intro	Draw title screen
Joy	Move sight using joystick
topfive	List the top five scores
name	Enter your name in table

```

1230 FOR AX=0 TO 48 STEP 4:IF AX<24 T
HEN GCOLB,1 ELSE GCOLB,0
1240 MOVE368-AX,740-AX:DRAW912+AX,740
-AX:DRAW912+AX,908+AX:DRAW368-AX,908+A
X:DRAW368-AX,740-AX:NEXTAX:GCOLB,0
1250 VDU24,368;740;912;908;;GCOLB,130
:CLG:MOVE448,884:PROCbigr("PISTOL"):MOV
E384,812:PROCbigr("SHOOTING")
1260 VDU24,136;564;1136;688;;GCOLB,12
9:CLG:VDU26:GCOLB,0:MOVE136,564:DRAW11
36,564:DRAW1136,688:DRAW136,688:DRAW13
6,564
1270 VDU26:MOVE160,656:PROCbigr("By Da
vid Taylor")
1280 GCOLB,130:VDU24,168;220;1104;548
:CLG:MOVE168,220:DRAW1104,220:DRAW110
4,548:DRAW168,548:DRAW168,220
1290 TT=0:IF $1>LW PROCname:VDU24,176
;228;1096;548:CLG:TIME=1000:TT=1:GOTO
1310
1300 VDU26:MOVE384,528:PRINT"CONTROLS
":MOVE192,464:PRINT"Z.....LEFT":MO
VE192,416:PRINT"X.....RIGHT":MOVE19
2,368:PRINT".....UP":MOVE192,32
0:PRINT".....DOWN":MOVE192,272:PR
INT"Return....FIRE"
1310 VDU24,168;64;1104;200;;GCOLB,129
:CLG:VDU26:MOVE168,64:DRAW1104,64:DRAW
1104,200:DRAW168,200:DRAW168,64:MOVE19
2,176:PRINT"PRESS SPACE OR":MOVE256,11
2:PRINT" FIRE TO PLAY"
1320 IF TT=1 THEN 1340
1330 TIME=0:REPEAT:$1=ADVAL(0) AND 3:
UNTIL INKEY=99 OR $1=1 OR $1=2 OR TIME
>=1000
1340 IF TIME<1000 THEN 1360
1350 IF TIME>=1000 SP=0:PROCoptive:1
F SP=1 THEN 1360 ELSE IF SP<>1 THEN 12
80
1360 JX=8:VDU19,1,1,0,0,0,19,0,0,0,0,
0,4
1370 IF BX=1 MX=1:GOTO 1390
1380 IF BX=2 MX=1:JX=2 ELSE MX=0:JX=0
1390 ENDPROC
1400 DEFPROCJoy
1410 IF ADVAL(1+JX)>=40960 X$=XX-((AD
VAL(1+JX)-40960)/768)
1420 IF ADVAL(1+JX)<=25600 XT=XX+((25
600-ADVAL(1+JX))/768)
1430 IF ADVAL(2+JX)>=40960 YI=YX+((AD
VAL(2+JX)-40960)/768)
1440 IF ADVAL(2+JX)<=25600 YX=YX+((25
600-ADVAL(2+JX))/768)
1450 MOVEXX,YX:PRINTCHR$(224)
1460 IF FX=1 THEN 1520
1470 BX=ADVAL(B) AND 3
1480 IF JX=2 THEN 1500
1490 IF BX=1 FX=1:PROCFire:GOTO 1510
ELSE 1510
1500 IF BX=2 FX=1:PROCFire
1510 IF BX=3 FX=1:PROCFire
1520 ENDPROC
1530 DEFPROCTopFive
1540 GCOLB,130:VDU24,176;228;1096;548
:CLG
1550 NT=1
1560 N2=1
1570 IF NMS(N2)<NMS(N2+1) THEN 1510
1580 AS=NMS(N2)
1590 NM$ (N2)=NM$ (N2+1)
1600 NM$ (N2+1)=AS
1610 N2=N2+1
1620 IF N2<5 THEN 1570
1630 N1=N1+1
1640 IF N1<5 THEN 1560
1650 P=0:MOVE352,528:PRINT"TOP SHOTS"
:FORA=5TO1STEP-1
1660 N3=8:REPEAT:W15=RIGHT$(NM$ (AX),N
3):N3=N3+1:UNTILASC(W15)<=5 AND ASC(W15
)>=48:N3=N3-2:N4=LEN(NM$ (AX))-N3:N5=14
-(N3+N4+3):NS=STR$(16-AX)+" "+LEFT$(NM
$ (AX),N4)+STRINGS(NS,".")+RIGHT$(NM$ (A
X),N3):LW=VAL(LEFT$(NM$ (AX),N4)):NM$ (A
X+5)=NS
1670 MOVE192,464-P:PRINTNM$ (AX+5):P=P
+48
1680 NEXTAX
1690 DATA100$pdud,200$ave,350$nick,500$e
ave,700$pdud
1700 SP=0:TIME=0:REPEAT:$1=ADVAL(0) A
ND 3:UNTIL INKEY=99 OR $1=1 OR $1=2 OR
TIME>=1000
1710 IF TIME>=1000 ENDPROC
1720 IF BX=1 MX=1:GOTO 1740
1730 IF BX=2 MX=1:JX=2 ELSE MX=0:JX=0
1740 SP=1
1750 ENDPROC
1760 DEFPROCname
1770 W2$="":FX21
1780 VDU26:MOVE192,528:PRINT"PLEASE I
ENTER":MOVE192,464:PRINT"YOUR NAME":MO
VE192,295:PRINT"-----":FORA=1TO5:REPEA
T:$1=GET:UNTIL BX=127 AND LEN(W2$)>=1
OR BX=13 OR BX>=65 AND BX<=90)
1790 IF BX>=65 AND BX<=90 W2$=W2$+CHR
$(BX):GCOLB,0:MOVE128+(LEN(W2$)+64),33
6:PRINTCHR$BX
1800 IF BX=127 W$=LEFT$(W2$,LEN(W2$)-
1):W1B$=W2$:W2$=W$:GCOLB,2:MOVE192+(LE
N(W$)*64),336:PRINTRIGHTS(W1B$,1):AX=A
X-2
1810 IF BX=13 AX=5
1820 NEXT AX
1830 NM$ (1)=STR$(S$)+W2$
1840 IF S$>=HS% HSX=$1:HSS=STR$(HS$):
LX=LEN(HS$):HS$=STRING$(4-LX,"0")+HS$-
1850 S$=0:GCOLB,0
1860 ENDPROC

```

# Taking control



THOSE of you who have been following my interfacing articles – Hardware Projects – will have picked up some of the basics of using the Electron to control other electronic devices, and I hope that the articles have encouraged you to try a few simple experiments.

One problem has always been how to start, and this book, *Control Applications of Microcomputers*, although not aimed specifically at Electron users, will get you going in the right direction, though a little extra help may be needed.

In it, Peter Mitchell offers a 160 page introduction to this vast area. The material is clearly aimed at the beginner, and the techniques needed to interface a variety of different devices, such as LEDs and stepper motors, are described.

The material is presented in a fairly easygoing and logical manner with chapters on number systems, logical operators and logic gates and 6502 assembler among the hardware information.

The diagrams are clear and meaningful, and the software side of control is covered with some introductory information on the 6522 VIA as used in the BBC Micro, the ACP Plus 5 and other user ports for the Electron. Listings in Basic and 6502 assembly language are given throughout the

## Joe Pritchard reviews a book for DIY enthusiasts

book for the Pet – a very old micro, late but not much lamented – Commodore 64 and BBC Micro.

The techniques described, will suit any Electron with a user port, and it's just a case of altering addresses referred to in the programs. Anyone with even a limited knowledge of Basic will have little difficulty.

An index is provided, but there's no glossary which would have been particularly useful, as computer control technique is littered with technical terms. Exercise programs are provided with typical solutions.

## Building a circuit

Control applications rely on at least a small amount of electronic construction. A little practical knowledge would be required to build the circuits described in the book. An absolute beginner might have difficulty due to lack of information on the "nuts and bolts" side of building

interfaces such as soldering, where to get components and the resistor colour code.

Anyone expecting a cookbook approach, with fully detailed instructions of how to build the more esoteric devices used in interfacing such as fast analogue to digital converters, digital to analogue converters and so on, will be disappointed.

These are covered at a system level – the connections needed to a typical ADC or DAC are there, but no specific circuit details are given. Fair enough, as detailed instructions to build such devices could easily take up a couple of complete chapters – quite a lot of space in an introductory guide such as this.

The book is aimed at users of three computers, and so loses a little of the machine specific information that many of us will be used to. For example, the typical analogue to digital converter referred to plugs in to the user port of any of the computers mentioned in the book, but no mention is made of the ADC built in to the BBC Micro, information that would be quite useful to Plus 1 owners.

## Criticisms

A similar criticism must be levelled at a couple of assembly language listings that write text to the screen. The method shown to write to a BBC Mode 7 screen is to access it directly with an STA instruction rather than to go through the osasci or oswrch operating system routines. This is used to demonstrate the use of STA, but these programs would need altering to run properly on the Electron due to the lack of a Mode 7 screen.

Despite these points, I did enjoy the book and feel that it presents a reasonable survey of an area of computer application that is rather neglected by the computer book publishers. The publisher, Edward Arnold, is known for its textbooks, and I get the impression that this is, at least in part, aimed at schools, where I feel that guidance from teachers would be on hand to help pupils through the practicalities of building circuits.

The chapters on machine code are particularly good as a general introduction to the basic 6502 instructions – certainly enough to allow the newcomer to sit down with a more specific Electron oriented book with more confidence.

It will help typical *Electron User* readers to get started on control, particularly if they have never had any contact with the subject. But when tackling the practical side be prepared to get a simple electronics book or a more experienced friend to help you out.

Title: *Control Applications of Microcomputers*

Price: £8.95

Supplier: Edward Arnold, 41 Bedford Square, London WC1B 3DQ.

Tel: 01-637 7161

# Here's how you can get the very best out of your Electron

Within the pages of these three books you'll find ALL the information you need to fully harness the power of your Electron. They cover Basic, machine-code programming and the operating system, and between them they also show how to combine all three to create more powerful and effective programs.

At only £2.95 each, or for the giveaway price of just £7.95 for the three, these books represent exceptional value and are a must for any serious Electron user.

## Electron Advanced User Guide

This detailed guide to the Electron's operating system is packed full of invaluable information. It shows you how to:

- Implement the powerful \*FX/OSBYTE calls
- Write your own paged roms
- Program the ULA
- Make every byte count where program space is tight
- Use the Electron's exciting capabilities to the full by following the complete circuit diagram
- ...and much, much more.

This essential handbook will help you to exploit the full potential of your Electron. And for just £2.95, saving £6.50 off the recommended price, can you afford not to miss this offer?

## Electron Assembly Language

The Electron Assembly Language reference guide will help you get to grips with machine code in next to no time. Whether you're a beginner or are already fairly proficient, there is something for you in this book.

It has over 200 pages packed with hints, tips and example programs on subjects ranging from basic hex, binary and decimal number theory and logical operators, through addressing modes, stacks and loops, to subroutines, jumps and calls.

Every aspect of machine-code programming is covered in this book in a friendly, readable style, and there's also a comprehensive index. If you want to get more out of your micro, but thought machine code was indecipherable, this is the book for you. Save £3 off the recommended retail price.

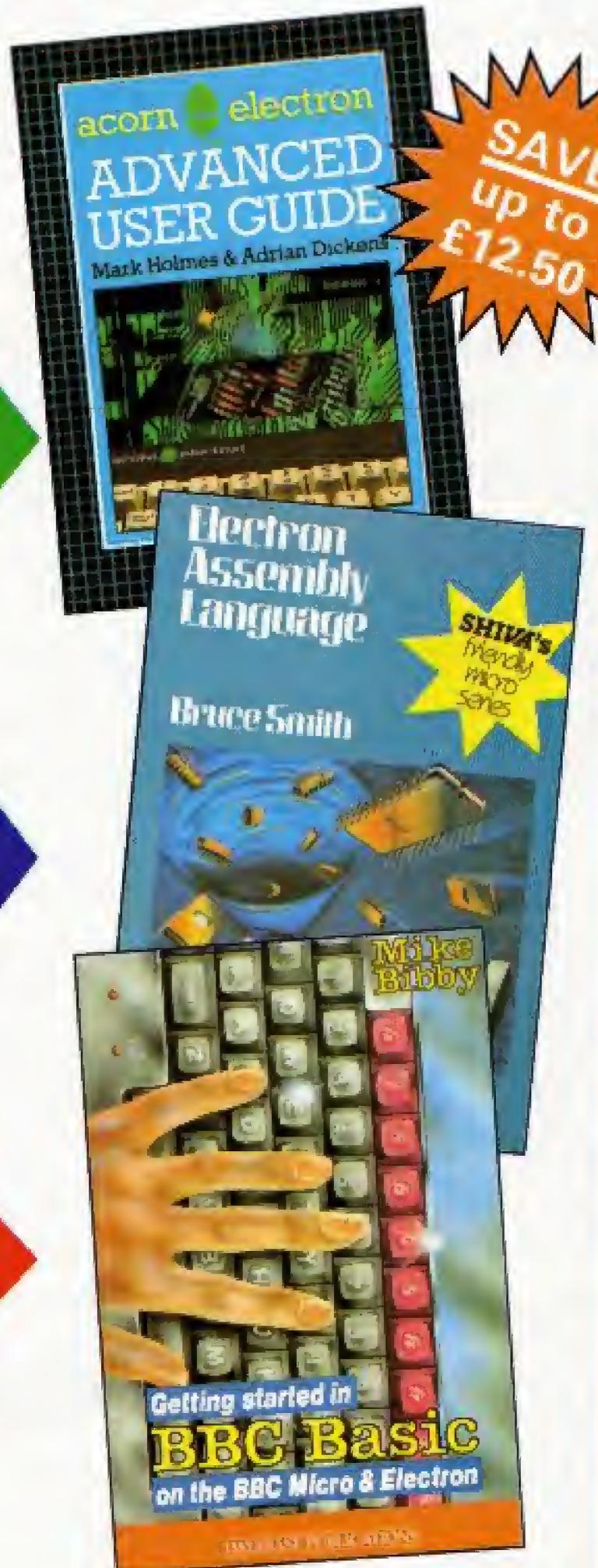
## Getting started in BBC Basic on the BBC Micro & Electron

This is the ultimate guide available on BBC Basic. Written by a leading expert on the language, it will lead you through each Basic function in a simple, easy-to-follow style.

Whether you are a beginner or more advanced, there are examples of commonly-needed routines and neat tricks you can use to make Basic jump through hoops.

By working through its many examples you will gain a clear insight into structured programming and will quickly acquire the ability to use structured techniques in creating your own programs. Save £3 off the recommended retail price.

**Only £2.95 each  
or £7.95 for all three**



**Buy your copies NOW, using the order form on page 45**



## THE ADVANCED PLUS 3

Now you can turn your Electron & +1 into a full disc system - no more waiting for tape loading or 'bad block' data? messages. A.P.3. gives you . . .

1. A fully Acorn compatible 1770 interface
2. 80 track 3.5" disc drive, as used by Acorn (320k capacity)
3. Separate PSU
4. Acorn ADFS
5. Welcome disc
6. Utilities
7. Full documentation
8. All the advantages of the original Plus 3 PLUS extra ROM socket.

**OUR TOP  
SELLING  
PRODUCT**

**UNBEATABLE  
PRICES**

All this without dramatically increasing the required desk space!

Now well into the SECOND THOUSAND production.

Remember - 2nd drives (3.5 or 5.25) can be added and the AP3 drive can be used on a BBC or Master computer! Also most Electron disc-based software is supplied on 3.5" ADFS discs.

The only fully compatible disc upgrade running Acorn's own preferred filing system (supplied on: Plus 3, Master 128, Master Compact and now the Archimedes)

\*\*\*EXTRA BONUS\*\*\*

3 games on disc - SNAPPER - DRAUGHTS - REVERSI  
**COMPLETE PACKAGE ONLY**

**£99.00 excl VAT; £113.85 inc VAT**

## ADVANCED PLUS 5

A unique interface for those wanting the maximum expansion from just one slot in the PLUS 1. AP5 contains:- a User port for connecting peripherals such as a mouse, 1 MHz bus allowing Music 5000(E), prommers and various control devices to be added, Turbo Interface for connecting an Acorn 2nd. processor or even a Master Turbo board (through a 'Co-Pro Adaptor') - & TWO spare ROM sockets (1 high priority). All hardware connections are Acorn compatible thereby allowing many BBC products to be added (remember that some software modification may be necessary for the Electron). So although some expansion options may appear expensive on an Electron you do have upward compatibility.

**£55.00 ex VAT; £66.70 inc VAT**

**ADVANCED PLUS 1** . . . The plus 1 is the main expansion for the Electron. It provides the Centronics parallel printer, printer port, joystick interface and 2 cartridge slots into which go ROM cartridges including View, Viewsheet, Pascal, Logo and our own popular AP4 disc upgrade.

**£43.43 excl VAT; £49.95 inc VAT**

**ADVANCED PLUS 6** . . . a fully buffered 6 ROM expansion module for the Electron user. AP6 is fitted inside the advanced Plus 1 or a modified Acorn Plus 1 (when used with the Acorn Plus 3, 5 ROM sockets are available). All sockets are designed to accept either ROM/EPROMS or RAM chips. A further feature is the optional AP7 upgrade.

"A marvellous piece of design . . . don't hesitate, buy it!" - EU, May '88

**£33.00 excl VAT; £37.95 inc VAT**

**UPGRADE SERVICE** for the original Acorn Plus 1 to Advanced Plus 1 and AP6. This will provide all the benefits of AP6 and also includes the printer circuit modification for some modern printers. (AP6 can be fitted to original Plus 1 by users with soldering experience) for upgrade service add £7.00 + VAT to AP6 price ie

**£40.00 excl VAT; £46.00 inc VAT**

Incl. Mod. Fitting + Testing & Carriage. Send to:  
P.R.E.S. Service Department, PO Box 34, Shipley BD17 6DE

## ADVANCED ROM ADAPTER 2

An Acorn approved cartridge containing a card with special 'zero' profile sockets that allow you to fit compatible 8k or 16k EPROMS/ROMS. The cartridge is fully enclosed providing complete protection for your ROMS. Simple to use - No switching - complies fully to the Acorn (sideways) Rom filing system.

"The best ROM cartridge is by far the ARA 2... A&B Dec 86  
**£13.00 excl VAT; £14.95 inc VAT**

## ADVANCED BATTERY-BACKED RAM

A standard Acorn approved cartridge but containing 32k (2 x 16k) of sideways RAM. The added bonus is the battery-backed feature that holds the RAM contents when the power is switched off! Different ROM images can be loaded into either bank from ROM images previously saved. The banks can also be locked to imitate ROM use. Now it is possible to have View & ViewSheet in one cartridge every time you switch on. Other uses include ADFS, printer buffer, ROM software development. The use of ABR is simplified by the newly written PRES software utilities which include:- SaveROM, LoadROM, Lock, Unlock, Printer Buffer, Zero and MakeROM a new utility to put your own software from disc or tape into ABR & use the ROM filing system. All software is supplied in ABR with a simple menu to transfer the utilities to your own media. No hardware switching - totally software controlled. Instructions for using supplied software and necessary information for users developing their own applications.

"It's a superb add-on and a must for all serious Electron users". . .  
Electron User

**£34.77 excl VAT; £39.95 incl VAT**

## ADVANCED QTRMEG RAM

A quarter megabyte is a whole 256k of extra sideways RAM. AQR provides this in a standard size, Acorn approved cartridge. Although ROM images can be loaded (with the appropriate software) into the various 16 banks of 16k RAM, AQR's primary and best use is as a RAM DISC. On an Electron this is achieved by using our ADFS 1.1 or ADFS & E00, both supplied with the necessary initialisation software to configure AQR as a 256k RAM DISC (the latter also regains 3.75k of main user memory on a Plus 3 system).

**£89.52 excl VAT; £99.95 inc VAT**

## ADVANCED PLUS 2 ROM

We feel this is one of the best, low cost, additions we have produced for the Electron & +1 user, especially for Plus 3, AP3 & ABR users.

Now with this easy to fit upgrade you can add:

1. Fix for Tape filing system in Hi-res screen modes.
2. \*ROMS - to display all ROMs/ROM images present on the system.
3. \*UNPLUG - disable ROM/RAM image.
4. \*INSERT - enables or inserts a previously unplugged ROM.
5. \*KILL - to totally disable the Plus 1.
6. \*LOCK - to lock a sideways RAM bank in ABR, AQR, AP7.
7. \*LROMS - to lock all sideways RAM banks found.
8. \*UNLOCK - to unlock a sideways RAM bank in ABR, AQR, AP7.
9. \*UROMS - to unlock all sideways RAM banks found.
10. \*SAVEROM - saves a copy of a ROM image to the current filing system.
11. \*LOADRUN - loads a ROM image from the current FS into a RAM bank.
12. \*FORMAT - will format an ADFS disc for Plus 3 or AP3.
13. \*VERIFY - reads and tests every sector on an ADFS disc.
14. \*VFORM - formats and verifies an ADFS disc in one command.
15. \*BUILD - creates a text file that can be used by \*EXEC (ie !BOOT).
16. \*LIST - displays a numbered listing of a text file.
17. \*TYPE - displays a file on screen with no line numbers.
18. \*DUMP - to view a file's contents on screen.
19. \*LANG - selects a default language to be booted on <CTRL-BREAK>
20. \*HELP - provides a full 'help' list on all the ROM's commands

**\*\*STOP PRESS\*\***

21. \*AQRPAGE - selects the specified page in any AQR present. Now there is no need to search for your utilities disc every time you want to Format/Verify a disc, Build a !Boot file or Lock/unlock/Load a ROM image into ABR PLUS much more . . . the ideal companion from the company that produces the Acorn Plus 1.

**£11.00 ex VAT; £12.65 inc VAT**

"The AP2 is the definitive Plus 1 Rom. . . I'm not sure what I'd do without it. . . Like all of PRES other products it's been well worth waiting for." EU July '88

## PRES ABR SOFTWARE

The new PRES ABR software now available separately containing: SaveROM, LoadROM, Lock, Unlock, Printer Buffer, Zero and MakeROM a new utility to put our own software from disc or tape into ABR & use the ROM filing system. Supplied on 3.5" ADFS or 5.25" DFS disc.

**3.5" £9.99 ex VAT; £11.49 inc VAT**

**5.25" £8.99 ex VAT; £10.34 inc VAT**

## ADVANCED PLUS 7

An internal battery-backed RAM upgrade for the Advanced Plus 6. TWO 16K pages of Sideways RAM, battery-backed and featuring full write protect facility. Just like ABR but fitted internally & vacating a cartridge slot. This product is compatible with all Acorn BBC/Master & Electron computers.

**£39.00 ex VAT; £44.85 inc VAT**

## \*\* USER PORT \*\*

A new low cost unit for those who just require a user port interface. Supplied in a standard size, Acorn approved cartridge, with the standard connector on top. Inside is a spare ROM socket which can also be configured for high priority use such as mouse software.

**£19.99 ex VAT; £22.95 inc VAT**

## ADVANCED PRINTER BUFFER

Newly written software from PRES that will use sideways RAM (ie ABR) to take text on its way to a printer from the computer & then continue to 'feed' the printer on demand while the computer is freed as soon as it has delivered up to 14k of text to the buffer. As printers are much slower than computers, this means you can carry on editing text in View while the printer takes text from the buffer at its own speed. Included are commands to turn the buffer ON/OFF, purge the buffer, control the effect <ESCAPE> has on the buffer and produce a buffer status report. Supplied on 3.5" ADFS or 5.25" DFS disc.

**£9.00 ex VAT; £10.35 inc VAT**

## NEW LOW PRICES

### ADFS VERSION 1.1

Suitable for existing Plus 3 or A.P.4 users. This new version has the software fixes for Zippyshelp, write protect disable & compaction. Also Winchester code has been replaced with the necessary driving software to handle AQR as a 256k RAM DISC. Please note - ADFS is Acorns adopted standard filing system supplied on the Plus 3, Master 128, Master Compact & now the Archimedes. Supplied on 16k ROM with Welcome disc & utilities. Please state 3.5"/5.25" welcome disk.

£14.95 ex VAT; £17.19 inc VAT

(ADFS manual supplied separately)

### ADFS ECO

For Electron users with either Plus 3 or A.P.4 and 32k of S/W RAM i.e. ABR. All the benefits of ADFS but without all the loss of RAM! Includes all the software 'fixes' as in version 1.1 as well as the AQR/RAM DISC code and an 'FX' call for managing the new & original ADFS. One of the most frequent questions we are asked: "How do I get back the memory lost on my Plus 3 system?" Answer: PRES ADFS & ECO regains 3.75k leaving page @ & ECO the same as Tape!

ADFS ECO supplied. 3.5" ADFS (manual available separately)

£14.95 ex VAT; £17.19 inc VAT

5.25" ADFS (manual avail. sep.) £14.00 ex VAT; £16.10 inc VAT  
5.25" DFS (2 discs+ADFS manual) £19.00 ex VAT; £21.85 inc VAT  
(See Special Package Prices)

### ADVANCED GAMES COMPENDIUMS - ON DISC

With so many of our products providing more 'serious' add-ons for the Elk, we thought it was time to allow easy access to some of the favourite games ON DISC! . . . Three volumes of popular games, previously only available on tape, now 'instantly' loadable from menu on disc. Each volume contains EIGHT menu selectable games. Available on 3.5" ADFS or 5.25" DFS.

Vol. I	Vol. II	Vol. III
Invaders	Felix and the Fruit Monsters	Danger UXB
Jet Power Jack	The Mine	Ghouls
Killer Gorilla	Rubble Trouble	Felix and the Evil Weevils
Stock Car	Swag	Adventure
Bandits @ 3	Cybertron Mission	Positron
Bumble Bee	Moonraider	Swoop
Croaker	Frenzy	Chess
Felix in the Factory	Escape Moonbase Alpha	Galactic Command

3.5" £9.99 ex VAT each volume; £11.49 inc VAT  
5.25" £8.99 ex VAT each volume; £10.34 inc VAT

### DISC DRIVES

	Ex VAT	+VAT
Cumana 5.25" dbl/sided 40/80 track, switchable, inc. psu.	£129.56	£149.00
Cumana 5.25" sing/sided 40 track, inc. psu.	£112.17	£129.00
Cumana 3.5" dbl/sided 80 track, inc. psu.	£112.17	£129.00
PRES special 3.5" sing/sided 80 track, inc. psu.	"ONLY" £59.00	£67.85

### DISCS

3.5" 10 in plastic library box - ideal for Plus 3 users	£19.95
5.25" 10 dbl/sided dbl/dens.	£12.99
5.25" 10 sing/sided sing/dens.	£8.99
5.25" Twin Gift Pack	£1.49

VIEW CARTRIDGE . . . the Acornsoft word processor for the Electron and Plus 1. Inc. full documentation.	£14.95
VIEWSHEET CARTRIDGE . . . the Acornsoft spreadsheet for the Electron and Plus 1. Inc. full documentation.	£14.95
VIEW & VIEWSHEET . . . both products as above 'special price'	£22.00
LISP CARTRIDGE . . . the Acornsoft language cartridge for the Electron and Plus 1.	£9.99

Turns your Electron into a computerised music production studio in which you can take a piece of music all the way from a sheet score, an idea of your own or one of the supplied examples, through entry, arrangement, replay and 'live' mix-down to a finished performance complete with custom instruments and studio effects.  
Music 5000 is supplied as a powerful, stereo, digital, eight voice, 16 channel synthesiser with ROM software (containing the AMPLIE language), disc software containing the example music files and full documentation.  
The requirement for Electron Music 5000 is . . . Electron, Plus 1, disc system (3.5 or 5.25 drive) running DFS or ADFS (preferably @ & ECO) i.e. Acorn Plus 3, A.P.3 or A.P.4, 1 MHz bus (best option A.P.5.1), and hi-fi amplifier or similar (Music 5000 has a standard 5-pin DIN audio connector for sound output). (Please state disc size & FS when ordering) £99.00 (ex. VAT) £113.85 (inc. VAT)

Please send order to:

P.R.E.S. LTD.,

6 Ave House, High Street,

CHOBHAM, Surrey, England.

GU24 8LZ. Tel: 0276 72048 (24 hr).

Fax: 0276 51427

(Mail order only)

All our prices include

UK delivery & VAT



(In event of any query  
please include your tel. no.)

Name . . .

Address . . .

Postcode . . .

Tel: . . .

Credit Card No.: . . .

## ACCESSORIES

### ELECTRON POWER SWITCH

For those who are fed up with removing the power connector every time when resetting the computer or for those whose jack-plug connector has become unreliable by removing the power at random! This useful accessory provides a double-pole inline switch with a new power jack-plug already attached: just connect to the existing lead, having removed the old jack-plug. £3.95 ex VAT; £4.55 inc VAT

### AP3 2nd DRIVE LEAD

Replaces existing drive cable with one containing an extra connector for adding a second drive configured as Drive 1.

£5.95 ex VAT; £6.85 inc VAT

### PLUS 3 2nd DRIVE ADAPTOR

Converts the fitting at the back of the original Acorn Plus 3, to take a standard disc drive connector when adding a second drive which has been configured to Drive 1.

£6.91 ex VAT; £7.95 inc VAT

A.D.F.S Guide Manual ..... £5.00

### SPECIAL PACKAGE PRICES

AP1 + AP3 .....	£130.39 ex VAT	£149.95 inc VAT
AP1 + AP6 .....	£69.52 ex VAT	£79.95 inc VAT
AQR + ADFS 1.1 .....	£78.00 ex VAT	£89.70 inc VAT
ABR + 3.5" ADFS ECO .....	£44.30 ex VAT	£50.95 inc VAT
ABR + 5.25" ADFS ECO .....	£43.33 ex VAT	£49.95 inc VAT
ABR + 5.25" DFS (ADFS ECO) .....	£47.00 ex VAT	£54.95 inc VAT

### ADVENTURE GAMES ON DISC

5 adventures available on disc for Electron users. Each game is sold separately on disc: Ultimate Prize, Dreamtime, Pirates Peril, Taroda Scheme and Stranded.

3.25" ADFS £6.95 ex VAT per Disc; £7.99 inc VAT per Disc

### THE TIMES COMPUTER CROSSWORD VOLUME 1

	Ex VAT	+VAT
ADFS 5.25"	£13.00	£14.95
ADFS 3.5"	£13.00	£14.95
DFS 5.25"	£11.26	£12.95
Cass	£8.65	£9.95

\*\*\* NEW \*\*\* AP3 INTERFACE ONLY ..... £52.00 ex VAT £59.00 inc VAT

### PRINTER

Printer ideal for Electron Plus 1. Panasonic KX-P1081 Graphic Epson Compatible NLO ready to connect including cable, delivery and VAT £155.65 ex VAT £179.00 inc VAT

ELECTRON ADVANCED USER GUIDE . . . further reading and information for the Electron user.

£3.95

ELECTRON ASSEMBLY LANGUAGE . . . book by Bruce Smith containing many examples of how to program in assembler.

£2.95

Software on disc for the above 3.5" ADFS £3.50 – 5.25" DFS £2.50

### COMING SOON

ADVANCED BASIC EDITOR+ . . . an exciting new product based on Acorn's original Basic Editor. It contains all the original features plus enhancements that make it one of the most powerful basic editors available. Supplied as a 32K ROM module or a cartridge with spare ROM socket.

ADVANCED FILE MANAGER . . . the ultimate 'front-end' system for disc users providing a powerful menu for managing files with BASIC View, Viewsheet etc., file deletion by marking-rename with wildcard facility – a highly sophisticated copy utility allowing files to be marked for copying over a wide variation of drive numbers, directories and filing systems (both DFS & ADFS), using any available memory as a buffer. Compatible with all the Acorn range of BBC/Master & Electron computers. 1MHz BUS . . . a new low cost unit for those who just require a 1 MHz Bus interface. Supplied in a standard size, Acorn approved cartridge, with the standard connector on top. Inside is a spare ROM socket for any application.

### MUSIC 5000

Turns your Electron into a computerised music production studio in which you can take a piece of music all the way from a sheet score, an idea of your own or one of the supplied examples, through entry, arrangement, replay and 'live' mix-down to a finished performance complete with custom instruments and studio effects.

Music 5000 is supplied as a powerful, stereo, digital, eight voice, 16 channel synthesiser with ROM software (containing the AMPLIE language), disc software containing the example music files and full documentation.

The requirement for Electron Music 5000 is . . . Electron, Plus 1, disc system (3.5 or 5.25 drive) running DFS or ADFS (preferably @ & ECO) i.e. Acorn Plus 3, A.P.3 or A.P.4, 1 MHz bus (best option A.P.5.1), and hi-fi amplifier or similar (Music 5000 has a standard 5-pin DIN audio connector for sound output).

(Please state disc size & FS when ordering)

£99.00 (ex. VAT) £113.85 (inc. VAT)

Product	Qty	@	Total
I enclose payment for £ . . .			
Exp date . . .			
			(Ref E110)

# Get into the action!

RRP £9.95 tape  
only on tape for Electron  
Our price 99p

Starship Icarus is plummeting towards the sun, and the only hope of averting the impending cataclysm is for you to teleport on board, disable the master computer and regain control...

This spectacular fast-action game has a unique split-screen which means that one player can complete the game on his own - or play simultaneously with a friend - to fight the trigger-happy droids which infest the ship.

With 20 levels of nerve-racking excitement, forcefields, mines, electronic doors, emergency lifts, movable walls, and opportunities to build up your armour, blaster and health ratings, this is one game you won't complete in a few weeks!

*And for only 99p when you subscribe,  
this is a game you can't afford to miss!*

*Get both of  
these for only*

**99 P** EACH

**when you subscribe  
to *Electron User*  
SAVE up to £14!**

That's right! Both of these excellent items can be yours for only 99p each, when you subscribe to your favourite magazine. So ensure you get your copy of *Electron User* delivered regularly, and take advantage of these superb offers - and save yourself up to £14!

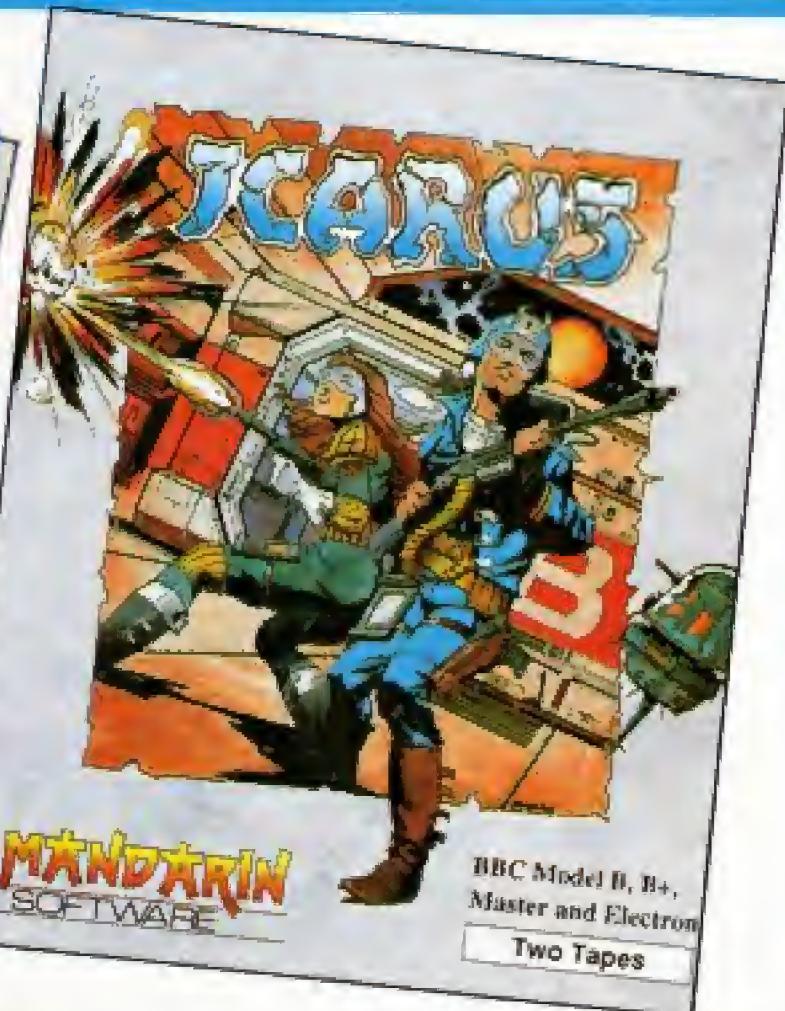
# TV Splitter

RRP £4.99  
Our price 99p

This device will come in handy for you if you double your TV set as a monitor for your Electron.

Just connect your TV aerial into one side of the Splitter, your Electron's output lead to the other, and then connect the box to the TV. Now, at the flick of a switch, you can change input to your TV from either your Electron or the aerial.

*With this handy box you'll save wear and tear  
on your leads and sockets and avoid those  
fiddly connections. It couldn't be more simple!*



**Place your order TODAY, using the form on page 45**

# Creepy Crawlie Capers

**Improve your spelling  
with the aid of Neil  
Davidson's fun game  
for young children**

In this educational game designed to help children improve their spelling you are required, not to spell complete words, but just to fill in a few missing letters. However, it's not as easy as it might seem...

You play the part of Spencer Spider who is competing with Archie Arachnid to get the curds and whey left behind by little Miss Muffet. At the start of the game you both hang from the brickwork at the top left-hand corner of the screen and dangle just above the ground.

First enter the speed of the game - press from 1 for slow to 9 for fast - followed by the difficulty level - 1 is easy, 9 is difficult. The speed sets the time allowed to answer each question, and the difficulty controls how far above the ground your rival Archie hangs.

A word will slide across the bottom of the screen on rollers and come to rest just right of centre. One of the letters in the word is missing and in the bottom left-hand corner are several alternatives. Press the key corresponding to the correct letter. This fires it out of a cannon and it will land in the correct position in the word, plugging the gap.

With every correct answer Spencer drops closer to the ground, but get it wrong and Archie drops down. When either of the spiders reaches the ground it will scurry across and grab the curds and whey and perform a victory dance accompanied by a cheery tune before making off with it.

If Spencer wins the curds and whey you move on to the next round and the game becomes slightly more difficult. If Archie wins you return to the beginning and start all over again.

There are 36 sample words included in the listing, starting at line 620 and you can alter them, or add more of your own. Indicate the missing letter by an underscore and follow the word with four alternative letters and finally the correct one like:

625 DATA Ele\_tronktpc

The word is Electron, and the missing letter is indicated by the underscore character. The four alternative letters are ktqp and the correct one is the last letter, c. If you add more words like this you'll also have to alter the DIM w\$ in line 50, which is currently set at 40 words.

```

10 REM Spencer Spider
20 REM By Neil Davidson
30 REM (c) Electron User
40 IF PAGE>4&DD0 GOTO 660
50 MODE1:DIMw$(40):LX=20:TIX=0:C$1
=0:C$2=1:C$3=0:WHX=0:lv=47,6731295:wd
$=STRINGS(20," "):nv$=STRINGS(10," ")
w$=STRINGS(15," "):LTX=0:L$=STRINGS(10
," "):P$=STRINGS(40," "):W2$=STRINGS(2
5," "):W2$=":FDR1%=-1 TO 25
60 W2$=W2$+CHR$(231+I1 MODE4):NEXT:W
HS=LEFT$(W25,20):BZ=FALSE:VDU23,224,83
F,840,888,888,888,840,83F,23,225,0
,0,87,81F,87F,87F,83F,0,23,227,3,BFF,1
,2,2,1,BFF,3,23,228,8;8FE,&FC,&FC,&FE,
8,23,229,0;0,840,840,81010;810
70 VDU23;8282;0;0;23,234,83C,842,
887,88F,88F,887,842,83C,23,233,83C,842
,881,881,889,88D,87E,83C,23,232,83C,84
2,8E1,&F1,&F1,8E1,842,83C,23,231,83C,8
7E,88D,889,881,881,842,83C,23,235,83C,
854,887,87E,852,889,852,0
80 VDU23,236,88,83C,86A,8EB,87E,84A
,891,84A,23,237,8,810,8,810,8,81
0,23,238,&FEFE;&FE,0,&F7F7;8FF,0,23,23
9,8FF,87E,87E,8FF,88F,89F,88F,&FF:ENVE
LOPE 1,131,-1,-1,-1,45,55,65,126,0,0,-
126,126,126

```

```

90 ENVELOPE2,5,5,0,-5,5,0,5,126,0,0
,-126,126,126:ENVELOPE3,1,1,0,-1,1,0,1
,126,0,0,-126,126,126:ENVELOPE4,1,2,0
,-1,2,0,4,126,0,0,-126,126,126:VDU19,2
,4,0;0;
100 C1X=1:C2X=2:C3X=3:PROCx(520,960
,256,128):COLOUR0:COLOUR131:VDU31,17,3
:PROCd("Spencer"):C1X=3:C2X=1:C3X=2:PRO
Cw(64,384,320,320):COLOUR3:COLOUR130:P
RINTTAB(3,21);Choose ":"COLOUR2:COLOU
R128
110 VDU31,27,1:PROCd("Score :0 ");CO
LOUR3:VDU31,27,3:PROCd("Time :0 ");CO
LOUR1:PRINTTAB(15,29):WH$:MOVE320,512:
VDU5,18,0,1,224,227,8,8,18,0,2,225,228
,8,8,11,229,4:COLOUR1:COLOUR131
120 PRINTTAB(2,17):STRINGS(10,CHR$23
8):STRINGS(10,CHR$8);CHR$10:STRINGS(10
,CHR$238):TAB(13,30):STRINGS(24,CHR$23
8):TAB(0,13):STRINGS(10,CHR$238):TAB(0
,1):STRINGS(12,CHR$238+CHR$10+CHR$13):T
AB(0,13):STRINGS(37,CHR$238)
130 PROCbox(64,416,64,320)
140 PRINTTAB(13,29):CHR$238;CHR$238;TAB(35
,29):CHR$238;CHR$238;TAB(13,28);

```

**Turn to Page 32 ►**



◀ From Page 31

```

CHR$238;TAB(36,28);CHR$238;TAB(15,27);
CHR$238;CHR$238;TAB(35,27);CHR$238;CHR
$238
    150 COLOUR3:COLOUR128:PRINTTAB(3,0);
    "You Win":PRINTTAB(17,31);"By Neil Dav
    idson";
    160 RESTORE 620:IX=0:REPEAT:IX=IX+1:
    READW$(IX):UNTILW$(IX)="END":MXZ=IX-1:
    VDU28,15,25,38,15:COLOUR1:PROCd("Speed
    level (1-9) ?");SPZ=(10-FNK)+5:CLS:PR
    OCd("Level (1-9) ?");S2I=FNK+2:CLS:$1X
    =8:S3X=S1X:S4X=S2X:VDU26
    170 PROCn:REPEAT:EX=FALSE:COLOUR3:CO
    LOUR128:S1X=S3X:S2I=S4I:FORIX=2 TO 12:
    PRINTTAB(4,IX)/*";TAB(7,IX);/*":NEXT:
    FORIX=1 TO S1X-2:PRINTTAB(4,IX+1);CHR$237:NEXT:PRINTTAB(4,IX+1);CHR$235
    180 FORIX=1 TO S2I-2:PRINTTAB(7,IX+1)
    );CHR$237:NEXT
    190 PRINTTAB(7,IX+1);CHR$236:COLOUR2
    :COLOUR128:PRINTTAB(30,12);CHR$239:REP
    EAT:LTX=LTX-1:SOUND1,3,10,254:REPEAT:C
    OLOUR2:COLOUR128:WD$=RIGHT$(WD$,21)+MI
    D$(NW$,NLX,1)
    200 PRINTTAB(14,28);WD$=NLX=NLX+1:WH
    $=MIDS$(W$,WHX,28):COLOUR1
    210 PRINTTAB(15,29);WH$=WHX=(WHX MOD
    4)+1:IFNLX=LEHNW$+1 THEN
    220 PROCwb(0):UNTILMIDS(WD$,12,1)=_
    ":COLOUR3:PRINTTAB(25,28);":PS=MIDS
    (PS,37-LTX*4,4):LT$=MIDS(L$,18-LTX,1):
    SOUND&11,3,50,2
    230 VDU28,2,28,11,23:COLOUR130:COLO
    UR:CLS:FORIX=1 TO 4:PRINTTAB(4):MIDS($P
    $,IX,1):NEXT:COLOUR3:COLOUR128:VDU26:
    TIZ=0:#FX21
    240 REPEAT:TIX=TIX:PROCwb(0):IFTIX<>T
    I:COLOUR3:VDU31,34,3:PROCd(STRS(SPX-TI
    I)+":SOUND&11,2,T14*2,2
    250 CS=CHR$(INKEY$ OR 32):UNTIL(CS>
    " AND INSTR(P$,$)) OR TIX=SPX:VDU28,
    2,28,11,23:COLOUR130:CLS:VDU26:IFTIX<
    SPX PROCfr(ASC$)
    260 IFlt$<>CS OR TIX=SPX PROCwg ELSE
    PROCct
    270 UNTILEX=TRUE:UNTILBX=TRUE:RUN:EN
    D
    280 DEFPROCfr(CX):GCOL3,2:GCOL0,128:
    T=0:XX=T*IV+384:YX=-10*(T^2)/2+512:VDU
    S:MOVEXI,YX:VDUC$:SOUND01,1,200,200:T=0
    .25:REPEAT:MXI=T*IV+384:NYI=-10*(T^2)/
    2+512:MOVEXI,YX:VDUCX
    290 MOVENXI,NYI:VDUCX:XX=NXX:YX=NYI:
    T=T+0.25:VDU4:PROCwb(0)
    300 VDU5:UNTILYX<=160:MOVEXI,YX:VDUC
    X:VDU4:COLOUR2:VDU31,25,28,CX:WS=WD$:W
    D$=LEFT$(W$,11)+CHR$CX+RIGHT$(W$,10):S
   OUND&10,-15,100,10:PROCdy(100):ENDPROC
    310 DEFPROCn:NLX=1:WS=" "+WS(RND(CXX
    )):NW$=LEFT$(W$,LENW$-5):LS=RIGHT$(L$+
    RIGHTS(W$,1),10):PS=RIGHT$(PS)+MIDS(W$,
    LENW$-4,4),4B):LTX=LTX+1:ENDPROC
    320 DEFPROCw(CX,YX,WX,LX):VDU24,XX-1
    6,YX-LX-16,XI+WX-16,YX-16:GCOL0,C1X+1
    28:CLG:VDU26:GCOL0,C2X:PROCbox(XX-16,Y
    X-16-LX,LX,WX):VDU24,XI;YX-LX;XI+WX;YX
    :GCOL0,C3X+128:CLG:VDU26:GCOL0,C2X:PR
    OCbox(XX,YX-LX,LX,WX):ENDPROC
    330 DEFPROCbox(XI,YX,LX,WX):MOVEXX,Y
    X:DRAWXI+WI,YX:DRAWXX+WI,YX+LX:DRAWXX,
    YX+LX:DRAWXX,YX:ENDPROC
    340 DEFPROCwb(SX):IFTIME<33:ENDPROC
    ELSE IFSZ=1 THENSOUND&11,3,S1Z*10,2 EL
    SE IFSZ=2 THENSOUND&11,3,S2Z*10,2
    350 COLOUR3:COLOUR128:PRINTTAB(4,S1X
    );CHR$(235+CS1X);TAB(7,S2X);CHR$(235+C
    S2X):CS1Z=CS1X EOR 1:CS2I=CS2I EOR 1:T
    IME=0:TIX=TIX+1:ENDPROC

```



```

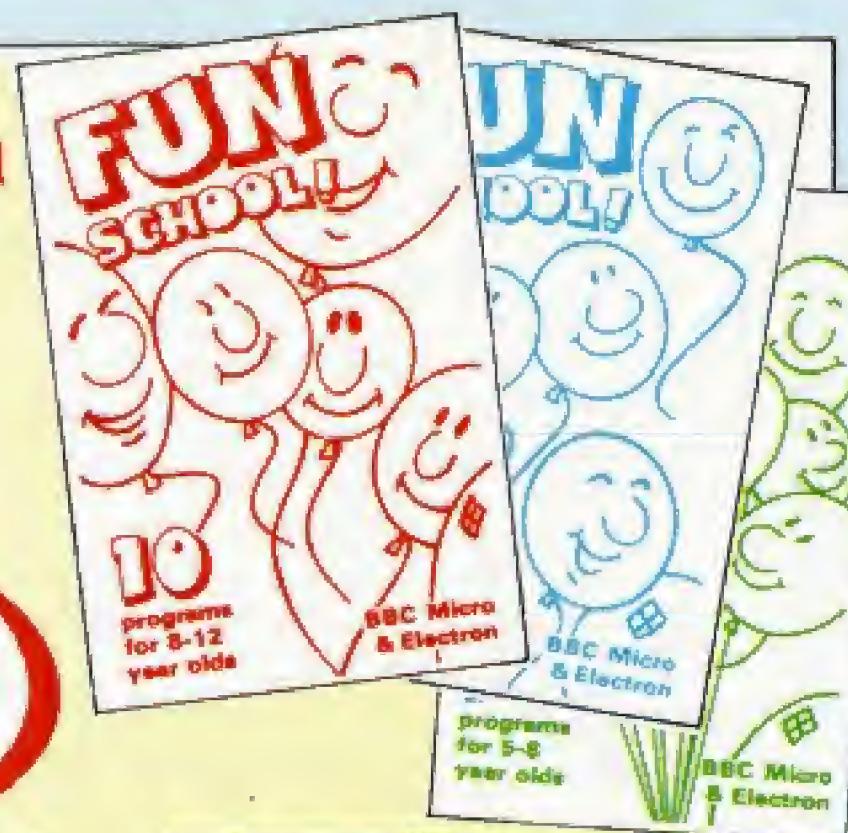
    360 DEFPROCct:SCX=SCX+1:COLOUR2:COLO
    UR128:VDU31,34,1:PROCd(STRS(CX)):COLOUR
    3:VDU28,15,25,38,15:FORIX=200 TO 50 ST
    EP-50:SOUND1,2,IX,20:NEXT:CLS:COLOUR1:
    PROCd("Correct .?"):PRINT":COLOUR2:PRO
    Cd("You spelt that?"):PRINT"
    370 PROCd("Word right !!"):COLOUR3:P
    RINT":PROCd("Watch your spider !"):VD
    U26:PROCubl(5,1):PRINTTAB(4,S1X);CHR$2
    37,:S1X=STX+1:TIME=100:PROCwb(0):OSCLE
    'FX15':PROCubl(5,1):IFS1X=12 PROCrn(4
    ):PROCCg
    380 VDU28,15,25,38,15:CLS:VDU26:ENDP
    ROC
    390 DEFPROCcg:SCX=SCX+5:COLOUR2:COLO
    UR128:VDU31,34,1:PROCd(STRS(CX)):VDU28,
    15,25,38,15:COLOUR1:CLS:PROCd("Well do
    ne .?"):PRINT":COLOUR2:PROCd("You beat
    the other?"):PRINT":PROCd("spider."):C
    OLOUR3:PRINT":PROCd("Press any key")
    400 VDU26:$1X=S1X-1:OSCLI'FX21':ZX=F
    ALSE:REPEAT:TIX=1:REPEAT:RESTORE 590:IX
    =1:REPEAT:READX,BX:PROCsrn:IX=IX+1:UN
    TILIX=58 OR IX=TRUE:FORUX=1 TO 7:READA
    X,BX:IFTIX=1 AND IX=FALSE:PROCsn
    410 NEXT:TX=TX+1:UNTILTX=3 OR ZX=TRU
    E:IFTIX=FALSE:PROCdy(150)
    420 UNTILZX=TRUE:EX=TRUE:IFSPZ>5 SPZ
    =SPZ-5 ELSE IFS4X<11 S4Z=S4Z+1 ELSE IF
    S3X>4 S3X=S3X-1
    430 ENDPROC
    440 DEFPROCwg:COLOUR128:COLOUR3:VDU2
    8,15,25,38,15:SOUND1,3,20,10:PROCdy(60
    ):SOUND1,3,2,1B:CLS:COLOUR1:PROCd("Sor
    ry .?"):PRINT":COLOUR2:PROCd("You spel
    t that word?"):PRINT":PROCd("wrong. Try
    again later."):COLOUR3:PRINT"
    450 PROCd("Match the other spider .?"):
    VDU26:PROCubl(5,2):PRINTTAB(7,S2X);C
    HR$237,:S2X=S2X+1:TIME=100:PROCwb(0):P
    ROCubl(5,2):IFS2X=12 PROCrn(7):PROCsy
    460 VDU28,15,25,38,15:CLS:VDU26:ENDP
    ROC
    470 DEFPROCsy:VDU28,15,25,38,15:CLS:
    COLOUR1:PROCd("Bad luck."):PRINT":COLO
    UR2:PROCd("The other spider got the."):
    PRINT:PROCd("curds and whey."):PRINT"
    :COLOUR3:PROCd("Press any key."):#FX21
    480 VDU26:S2X=S2X-1:REPEAT:PROCwb(0)
    :UNTILINKEY$0>":EX=TRUE:BX=TRUE:ENDPR
    OC
    490 DEFPROC(A$):AX=BA:YX=870:YZ=0:F
    DR2X=1 TO LENA$:?870=ASC(WJD$(A$,2%,1
    )):CALL&FFF1:VDU23,255,8761,8761,8772,?
    872,873,873,874,874,255,8,10,23,25
    5,875,875,876,876,877,877,878,?
    878,255,11:NEXT:ENDPROC
    500 DEFPROCrn(5P%):COLOUR3:COLOUR12
    8:FORIX=SPX TO 28:PRINTTAB(IX,12)/*";C
    HR$(235+CS1X):CS1Z=CS1Z EOR 1:SOUND&1
    1,2,IX*5,3:PROCdy(10):NEXT:PRINTTAB(29
    ,12);/*"
    510 FORIX=1 TO 5:PRINTTAB(30,11);CHR
    $(235+CS1X):CS1Z=CS1Z EOR 1:SOUND&11,2
    ,IX*5,3
    520 PROCdy(10):NEXT:PRINTTAB(30,11);
    /*":FORIX=28 TO SPZ-1 STEP-1:(COLOUR3:P
    RINTTAB(IX,12);CHR$(235+CS1X));:COLOUR2
    :PRINT:(CHR$239);/*":SOUND&11,2,IX*5,3:C
    S1X=CS1X EOR 1:PROCdy(10):NEXT
    530 COLOUR3:PRINTTAB(SPX-1,12)/*";I
    AB(SPZ,11);CHR$(235+CS1Z):FORIX=1 TO 1
    0:PRINTTAB(SPZ,11);CHR$(235+CS1Z):SOUN
    D&11,2,IX*5,3:CS1Z=CS1Z EOR 1:PROCdy(10
    ):NEXT:ENDPROC
    540 DEFFNk:OSCLI'FX21':REPEAT:AX=GET
    -4B:UNTILAZ>0 AND AX<10:=AZ
    550 DEFPROCDy(UZ):TIME=0:REPEATUNTIL
    TIME>UZ:ENDPROC
    560 DEFPROCwbl(RX,SX):IX=TIX:REPEAT:
    PROCub(SX):UNTILRI=TIX-TIX:ENDPROC
    570 DEFPROCsn:Sound1,4,AJ,BX*2:FIN
    KEY$0>":ZI=TRUE
    580 PROCdy(BZ*12):ENDPROC
    590 DATA 100,4,100,3,100,1,88,4,88,4,
    88,3,80,1,88,3,92,1,88,8,92,4,88,3,100
    ,1,88,8,72,4,88,3,80,1,52,8,88,4,88,3,
    80,2,100,2,100,2,92,2,88,3,80,1,88,3,9
    2,1,88,8
    600 DATA 60,4,88,4,88,4,84,2,96,2,11
    6,16,116,2,100,1,116,1,100,1,104,2,108
    ,2,80,2,88,2
    610 DATA 92,4,88,1,92,1,88,1,72,2,108
    ,2,100,8,100,2,72,2,52,2,92,2,88,4,88,
    4,72,4,52,2,60,2,68,2,72,2,80,2,88,2,9
    2,2,72,6,72,4,72,4,72,16
    620 DATA Adran,legjneg,yello,ewouw,tel_
    stopeiuae,bathro,muiwoa,jell_yfeuy,ne
    v_yeufi,i_impossiblempim,import_ntaeua
    ,bri_kckirc,poss_bleatueii,int_restinga
    etue,s_mpattyiyeyay,se_teutaa,gover_men
    tnrrn
    630 DATA Acreation,ontcsrt,spi_ycsycc,hid
    d_nauiee,plea_ezscas,sep_rateeiua,de_
    freszcrs,ac_ompanykouce,driv_nauiee,su
    _gestjqueg,station_ryaiuoza,hospit_liae
    ua,sc_oothkcoh,sp_fyeuy,holiday_eiay,a
    _roplanealere,par_neteaue,excuse_ecuzzs
    640 DATA Ak_iphoneeeiyxy,f_propermpim
    ,flow_reauie,weather_ieuuue,w_etheraeuh
    650 DATA END
    660 *T.
    661 *K,B DX=PAGE-6E00:FORIX=PAGE TO
    TOP STEP4:!(IX-DI)=!IX:NEXT!:!(TOP-DI)=
    8FF0D:PAGE=6E00MOLOMRUNN
    670 *FX138,0,128

```

# Learning CAN be fun

- Use your Electron to teach and amuse your children at the same time.
- Three packages crammed full of educational programs – and so easy to use!
- Each program has been educationally approved after extensive testing in the classroom.

**ONLY**  
**£4.95 tape**  
**£5.95**  
**3½" disc**



## Ages 2-5

Alphabet  
 Colours  
 Counting  
 House  
 Magic Garden  
 Matchmaker  
 Numbers  
 Pelican  
 Seaside  
 Snap



**PELICAN**  
*Teach your children to cross the road safely at a Pelican crossing*



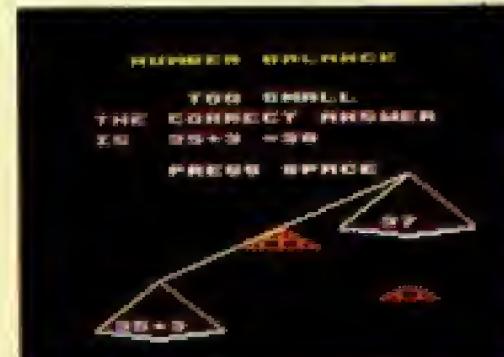
**HOUSE**  
*Select the colours to draw a house – hours of creative entertainment*

## Ages 5-8

Balance  
 Castle  
 Derrick  
 Fred's Words  
 Hilo  
 Maths Test  
 Mouser  
 Number Signs  
 Seawall  
 Super Spell



**NUMBER SIGNS**  
*Provide the correct arithmetic sign and aim to score ten out of ten*



**BALANCE**  
*Learn maths the fun way. Type in the answer to balance the scales*

## Ages 8-12

Anagram  
 Codebreaker  
 Dog Duck Corn  
 Guessing  
 Hangman  
 Maths Hike  
 Nim  
 Odd Man Out  
 Pelmanism  
 Towers of Hanoi



**HANGMAN**  
*Improve your child's spelling with this fun version of the popular game*



**ODD MAN OUT**  
*Find the word that does not fit – before your time runs out*

**TO ORDER PLEASE USE THE FORM ON PAGE 45**



## SLOGGER

# WHAT PRICE QUALITY? WHAT PRICE COMPATIBILITY?

To quote a well known phrase, "You only get what you pay for"

This we feel sums up SLOGGERS pricing policy. Our goods may not always be the cheapest, but the products are most certainly amongst the best.

## THE PEGASUS 400 DISK DRIVE SYSTEM

Using only top quality components, the system comprises of:

The SLOGGER 40/80 Track double sided 5.25" Disk Drive which maintains

- 400k storage per disk, built in power supply.
- Manufacturers 1 year guarantee.
- Internal Power Supply unit.
- Compatibility with the inexpensive (yet most reliable) 5.25" disks.
- Reliability at 6 m/s step rate (four times faster than some drives).

The SLOGGER PEGASUS Disk Interface which boasts

- Excellent Computer Aided Design (CAD) production
- Acorn approved design and standard WD1770 floppy disk controller
- NEW Type-Ahead facility when used with Master RAM Board
- READ/WRITE Shadow Screen when used with Master RAM Board
- 90 page documentation usually provided as a separate purchase
- Compatibility with the ACP ADFS Version 1.1, which offers a total 640k when used with SLOGGERS 5.25" Disk Drive

The SLOGGER SEDFS ROM, about which the Electron User magazine enthused

"I can recommend SEDFS unreservedly"

"Anyone considering upgrading to disk"

"SEDFS is the logical choice"

The quality of SEDFS speaks for itself, unlike other filing systems it offers

- No loss of Electron memory, PAGE=&E00 (not &1D00)
- Full Acorn DFS (BBC Model B and MASTER SERIES) compatibility
- All utilities built in, requires no additional menacing utility disk

**PEGASUS 400 (Including Interface) ..... £159.50 (inc VAT)**

**PEGASUS INTERFACE (Only) ..... £74.95 (inc VAT)**

## MASTER RAM BOARD

### Upgrade your Electron to a 64K Machine

- Fits inside the Acorn Electron, uses no cartridge ports.
- Compatible with ALL reliable Electron hardware (except TURBO DRIVER).
- Compatible with ALL Electron software, switching between 64K mode, TURBO mode (yes... the TURBO DRIVER IS BUILT IN), and normal mode.
- For correctly written software, HIMEM is ALWAYS AT 8000 in 64K mode so leaving 28000 bytes for BASIC or WORD PROCESSING in ALL screen modes.
- Doubles the speed of Word Processing.
- Up to 300% speed increase for games.
- Additional 12K for use as Printer Buffer with Expansion ROM 2.0.
- Installation Service (See Details below) for those not confident of desoldering the 6502 Microprocessor

#### NEW FEATURES

- 64K Mode fully compatible with 98% of Level 9 BBC Adventure games.
- NEW OS 2.1 - PLAY ACORN SOFTWARE'S ELITE WITH SLOGGERS JOYSTICK INTERFACE.

Master RAM Board Kit - code MR2 - Now Only £49.95

## INSTALLATION SERVICE

Send your computer to us and we will upgrade and return your computer within 48 hours.

Order MR1 £59.95

## PICASSO

With the power of the illustrator software you can now use your Electron to create drawings & graphic pictures controlled by the famous Digimouse.

The mouse is connected to your computer through the user port which requires one slot of the Rom Box Plus or Plus One.

The illustrator software is loaded from disc and contains all the programs and examples of what can be done with this package. The software is also programmed to print your creativity onto a printer.

The Picasso packages are:-

- |  |        |
|--|--------|
| Digimouse, User port, Illustrator (5.25" disc) ..... | £75.00 |
| Digimouse, Illustrator (5.25" disc) .....            | £49.50 |

## ROMBOX PLUS

SLOGGER's answer to the PLUS 1

Q. Why not buy the Acorn Plus 1?

A. Because "Excellent though the Plus 1 is, I think there is still room for improvement" said the Electron User Magazine.

The ROMBOX PLUS has this improved specification:

1. Four ROM/RAM sockets to free the cartridge slots for more important add-ons. Each socket can take the usual 8K/16K ROMs but can also take 16K RAMS offering a staggering 64K SIDEWAYS RAM
2. The PLUS1 Cartridge slots.
3. The PLUS1 Centronics printer port.
4. The Expansion ROM 2.0
5. Switched Joystick Interface available.
6. Analogue Joystick interface under development.

Still Only £54.95

## EXPANSION ROM 2.0

for ROMBOX PLUS or PLUS 1

- Supports Printer Buffer with 8K/16K sideways RAM or 12K with MASTER RAM BOARD.
  - RSAVE command to save ROM images to tape or disc.
  - RLOAD command to load Sideways RAM with a ROM image.
  - ROMS command to display ROM/RAM in system.
  - JOYSTICK command for the SLOGGER Joystick Interface
  - Allows cassette loading in high resolution.
  - Supports all standard functions (Printer, ADC, RS423)
  - Simply fits into Internal ROM socket.
- "There is room for improvement in the operating system. No doubt this was the idea behind Expansion 2"
- Electron User, July 87*  
Only £11.95  
£7.95 if purchased with 32K SIDEWAYS RAM or JOYSTICK INTERFACE

## 32K SIDEWAYS RAM CARTRIDGE

for ROMBOX PLUS or PLUS 1

- Ever popular on the BBC
  - Best used with EXP ROM 2.0
  - (1) Save ROM backups for loading into Sideways Ram.
  - (2) Set up a 16k Print Buffer
  - Splits as 2x16k pages
  - VIEW and VIEWSHEET in one slot!!!
  - Write protect option... prevents corruption of software.
- "A very powerful piece of hardware"
- Electron User July 87*  
ONLY £24.95  
£32.95 with EXP ROM 2.0

## SLOGGER EPROM CARTRIDGE

- Carries TWO 8K/16K ROMEPROM software
- Compatible with PLUS 1, ROMBOX PLUS and BBC Master.
- Simply plugs into cartridge slot

£12.00 for a limited period

## ROM SOFTWARE

STARSTORE 2	£29.95
SEDFS upgrade ROM for CUMANA owners	£24.95

## \* BARGAIN CORNER \*

STARWORD	Word Processor	£19.95
STARSTORE	Database	£11.95
STARGRAPH	Graphic Utilities	£11.95
ELKMAN	ROM/RAM Manager	£11.95
STARMON	Machine code Monitor	£11.95
PRINTER ROM	Simplified Printer Control	£11.95
STAR TREK	Machine code disassembler	£11.95
PDG	Printer Driver	£11.95

SEND  
FOR  
THEM  
TODAY

## 64k ACORN ELECTRONS

THESE ELECTRONS ARE FITTED WITH THE MASTER RAMBOARD AND ARE FULLY TESTED AND GUARANTEED WHEN PURCHASED DIRECT FROM SLOGGER

64k ELECTRON  
(Switchable)  
£114.95

## JOYSTICK INTERFACE

for ROMBOX PLUS or ACORN PLUS 1

- Uses inexpensive ATARI-type joysticks
  - Compatible with ALL Tape and Disk systems.
  - Emulation of keys by Expansion ROM 2.0
  - Can be used with well written games either WITH OR WITHOUT A JOYSTICK OPTION
- "The ultimate Joystick Interface"
- A&B July 87*  
"Well worth saving up for, I can recommend it to all Arcade Addicts"
- Electron User May 87*  
Only £14.95  
Only £5 with this unit

## JOYSTICKS

Switched Joysticks for the Slogger Joystick Interface  
Quickshot I £5.00  
Quickshot II £8.00

Please contact us for your Local dealer

## HELP!

Contrary to what the critics used to say the Electron market is now established and respected. There are a variety of very good products available already (some better than the BBC) but I'm sure there are plenty more possible. Please contribute by writing to Helpline at our new address, giving your idea, and why you think it's suitable for the Electron. You never know you may receive a reward in the post.

All prices include VAT P&P UK Mainland only

Cheques payable to  
SLOGGER LTD. Tel: 0272 237496

Expiry Date	PLEASE SUPPLY	Cost
1	Access No.	£
2	Visa	£
3	Name	£
4	Address	£
5		£
		Total £

Please send orders to SLOGGER LTD, 7 APSLEY ROAD, CLIFTON, BRISTOL BS8 2SH

# Top 10 Adventures

By Pendragon

I HAVE received dozens of entries to the competition I announced in the June column for readers to send in their own Top 10 favourite Electron text adventures. I am afraid that I had to disqualify a few missives that did not keep to my rule of 32k tape-based adventures only.

The most convincing chart was sent in by Emma Rutherford, a regular contributor to this column. My only point of contention is that no Larsoft adventures appear in this list. Copies of my 10 best adventures are now winging their way to Emma.

I have also received a few letters from readers who have had difficulty entering the fix published in my July 1988 column for the bug in the

1	Saga of a Spy Trilogy	Robico
2	Village of Lost Souls	Robico
3	Wheel of Fortune	Epic
4	Classic Adventure	Melbourne House
5	The Lost Crystal	Epic
6	Sphinx Adventure	Acornsoft
7	Woodbury End	Shards
8	Twin Kingdom Valley	Bug Byte
9	The Hunt	Robico
10	Philosopher's Quest	Acornsoft

Emma Rutherford's winning Top 10 adventures

save game facility of Twin Kingdom Valley. I omitted to mention that TKV is a locked program. You will have to hack your way past the protection before you can alter the program.

One or two readers have also contacted me regarding difficulty in running the Topologika disc adventures. These games were written for the BBC Micro, but can be run on an Electron fitted with Slogger's Master Ram board connected to an SEDFS or Pegasus disc system. Problems begin to appear with other configurations, especially if these involve the Slogger 2.0 os and the Plus 1. Poking into the Plus 1 (Micro Messages, August 1988) may help you.

I have come across a similar problem with some Level 9 adventures. However, once I had disabled the Plus 1 and relocated the loading page, these adventures ran without a hitch.

Two new adventures arrived in my throne room this month, both of which deserve a mention before I sharpen my quill for review.

## Locked out of the Valley

For the benefit of Chris Campbell, Victor Robinson and any other readers still floundering in Micropower's *Adventure*, these two tips may prove helpful: Kill the dragon with your bare hands and store all the treasures you find in the lost property office.

*Adventureland* was the first adventure ever released for a home computer, yet still baffles novices and experts alike. One of the most perplexing problems involves the eggs. To elaborate on last month's hint, the correct sequence is: SAY AWAY, DROP BEES, GET EGGS, SOUTH, ENTER TREE, DROP EGG, DOWN, ENTER HOLE.

The Elk Adventure Club's *Axe of Kolt* is already posing some difficulties. In part 1 you should talk to the armourer, then buy the axe, which can be used to chop the logs. You must also give the hammer and the nails to the ferryman before boarding his ferry.

Geoff Livesey asks how to get the platinum pyramid out of the player room in *Classic Adventure*. You can't get it through the crack

Geoff, so use a magic word instead. Next month I will begin serialising a solution to Melbourne House's howler, *Dodgy Geezers*. Meanwhile Tom Jenkins needs to examine inspection point 746 as his likely point of entry to the bank in part 2 of this game.

David Harris and Elizabeth White have written to ask about the significance of the fan in *Enthar Seven*. As far as I am aware, it is only an insurance policy in case you overhear in the arid area. Ideally you should have the forked stick to divine a safe path across the desert.

*Escape from Pulsar Seven* continues to raise some interesting questions. James Farmer asks how to open the locker. You should discover a hammer in the engine room, James. This tool can be used to smash the locker. If you examine its contents you will find a suit which must be worn with the boots at the end of the game.

In *Gafadriel In Distress*, Daniel Gilbert should rub the hinges with butter to prevent

## Problems

the gates from creaking as he opens them. The vent system in *Gremlins* is causing all sorts of problems for Darren Steer. You must trap the gremlins in the vent system, weld a plate over the vent door, then cause an explosion.

*Epic's The Lost Crystal* does not tend to pose too many questions, as the game comes with a most comprehensive Help book. However, one task which confuses a lot of people is how to deal with the hydra. Anyone who is familiar with Greek mythology will be aware that cutting off one of the hydra's heads only encourages the growth of two more. It is best to avoid this beast by wearing the cloak of invisibility or temporarily disabling her by using the sword or arquebus.

*The Nine Dancers* remains one of my all time favourite games, partly because all of the problems have logical solutions. One such chaining puzzle involves a toadstool, a hare and a dog. To get past the black dog you must first catch the hare and stuff it with the

## Adventurer's Glossary

Nails: For hammering or pulling.  
Necklace: Usually a treasure, but may have magical properties if worn.  
Nest: Search it, as it usually belongs to a magpie, and may contain valuable treasure.  
Net: For catching fish or bigger prey.  
Niche: Examine it carefully.  
Note: Examine and read it.  
Oak panels: May be hiding a secret door.  
Octopus: Very dangerous, but its ink could be useful.  
Ogre: Almost certainly needs killing.  
Olive branch: An ingredient of magic.  
Onyx: A treasure.  
Opal: Yet another treasure.  
Orange: Eat it for sustenance or instant transportation.  
Orb: A mystical treasure.  
Orc: A hideous, giant hobgoblin.



purposes. *In Search of Atahualpa* is scribed by Anthony Lee using the Quill adventure writing utility. It is a two part archaeological fantasy based in Peru. At only £2.50, it is a bargain and must be worth a look.

*Plane Crash* by Labyrinth Software is a three part experience which examines the possibilities of escape from a crashed plane. The adventure is something akin to a jungle version of Winter Wonderland. It has been cleverly written with some interesting time factors operating (see our software reviews).

It is refreshing to see adventures emerging for the Electron from new software houses. This only underlines the fact that the Electron continues to flourish despite the knowledge that its contemporaries have gone the way of all dust.

A pigeon has also brought me news of two impending releases from Robico Software. *Blazing Star* will appear as a twin cassette graphical adventure before Christmas alongside a text-only escapade based on the story of *Mutiny on the Bounty*. More details on these releases will appear in next month's column.

As promised, and due to popular demand, you will see that I am featuring a much extended Problems Solved section, which contains hints and answers for well over 20 different adventures. I have also printed a map of the Lost World maze in Acornsoft's *Kingdom of Hamil*. • Next month I will feature a map from the ancestor of all micro adventures, *Classic Adventure*. That's it for this month, so until the room needs repainting, happy adventuring.

## Readers' Hall of Fame

*Castle of Riddles* - Roger Asher (continued from last month)

Go NE, W, RAINBOW, N, NW, NE, SE, NE, NW, NW, SW then drop the box and the CASE. Head NW, NE, NE, ICICLE, N, E and get the diamond. Go S, S, SE, SW then get the brooch and clock. Go NW, SW and get the mink. Travel NE, NE, NE, N, N, UP, E, JUMP and get the cushion.

Go N, N, NE, N, SE, N, then look around, OFF and drop the mink, ON, UP, OFF, N, S, ON. Drop the cushion, onyx, brooch and diamond, then go down and get the port, coin, vase and mink. UP then drop the port, coin, vase and mink. DOWN, LOOK, get the figure, necklace and tiara.

Go up and get the cushion and mink. GLOOP. Go W then drop the figure, necklace, tiara, cushion and mink. Travel E, get the diamond, port, brooch, coin and vase. Go W and drop the diamond, port, brooch, coin, vase and clock. Go E and get the onyx. Go W and drop it, then go E and down. YES, TONPIE. Success!

## Solved

pixie stool. Leave this delicacy for a while, then throw it outside the hut. The dog will eat the poisoned morsel and fall asleep, allowing you to climb the hill and enter the fairies' chambers.

An old friend, Cathy Fromant, is having headaches with *Myorem*. I think you need to throw the fire extinguisher in the tunnel if you are to make progress to the end game.

Geoffrey Bowen is struggling at an advanced stage of Level 9's *The Price of Magik*. To retrieve the salt from the coloured chests you must use magik, Geoffrey. Cast the spell DOW at each chest in turn to discover the correct one to open. You must then throw the salt at the slug - seems like a good idea.

Karen Stone and Maria Melnyk of Bradford both have dilemmas about what to do with the bull in *Terrormolinos*. Wave your hanky and lead this creature to the china shop. Don't forget to take a photo. James Abbott can't find the pink carnation in Robico's *Project*

*Thesius*. I suggest you look in the flower border, beyond the lawn and paved path.

Mr R. Withrington writes to say that each time he attempts to cross a bridge in *Sphinx Adventure* the bridge collapses beneath him. If you look over your shoulder you will find that either the giant rabbit or the bear is following you, Mr Withrington. They are both too heavy for such flimsy structures as bridges. You must feed the carrot to the rabbit and use the bear for goblin baiting to avoid such catastrophes.

In *Potter's Staff of Law*, Sheila and Len must turn the capstan to drain the river. You may then read the runes which hold the secret incantation. *Suds* poses some real bafflers for those whose sense of humour isn't quite as warped as an elderly king like myself. For instance, to make the pass valid you will have to erase the inscription by using a leaf from the rubber plant. Later you will need the cobweb and the pancake for stage make-up.

*Jatravariid Blob* can't get the machine to

work in the *Digital Fantasia* game, *Time Machine*. The correct procedure when you first discover the machine is GET TORCH, PLAY CASSETTE, GO MACHINE, 1, DROP TORCH, LEAVE MACHINE. Simple really.

Meanwhile, in *Twin Kingdom Valley*, Peter Youde must wear the uniform to get back into the castle. *Voodoo Castle* has stymied David Lowid. He must always carry the shield when venturing near exploding chem tubes. The laboratory will also provide an incredible shrinking liquid to enable him to emulate Alice and pass through the small doorway.

A number of readers have written to ask for the names of the aliens in the Shards cracker, *Woodbury End*. The guilty personae are Mayor Hardy, PC Armstrong, Mrs Ackroyd, Fred Bates and George Roberts.

Finally, Duncan Beely asks me to recommend some good adventures for beginners to this form of mental exercise. You won't go far wrong with either *Voodoo Castle*, *Wychwood* or *Riverdale's Suds*.

***Everything you ever wanted to know about your Electron but were afraid to ask is in these back issues of Electron User magazines and on the tapes and discs***

## electron user

### BACK ISSUES!

Don't miss out on the most informative Electron magazine on the newsstands — bring yourself up to date with these back issues. Each one is packed with games, utilities, features and programming tutorials.

#### April 1988 issue:

**Games:** Go-Pig, Dozer Disorder. **Features:** Part 1 of Codename Droid map, build an anemometer, guide to Viewsheet, adventure hints and tips, memory map explored part 1. **Utilities:** Squashed character sets, sprite print routines. **Programming:** Pascal tutorial, beginners' guide to machine code part 2.

#### May 1988 issue:

**Programming:** Machine code tutorial part 3. **Games:** Lion's Lair, Keyboard Gremlins, Lucas' Problem. **Features:** Quest author reveals all, Plus 6 reviewed, part 2 of Codename Droid map, Adventure hints and tips. **Utilities:** French to English translator, guide to Viewsheet, colour emulator, shadow ram database, machine code map making.

#### June 1988 issue:

**Games:** Fibonacci Nim, Bomb Alert. **Features:** Adventure hints and tips, four-page pullout guide to software, memory map part 2, Viewsheet guide. **Utilities:**



ONLY  
£1.75  
each

Procedure and function lister, shadow ram routines, car route database. **Programming:** Machine code tutorial part 4, writing scrolling map routines.

#### July 1988 issue:

**Games:** Knockout Whist, Randall Rabbit, Tilley the Train, Tennis. **Utilities:** Shadow ram filing system, machine code score routines, Easy Reader. **Reviews:** Advanced Plus, SpyCat. **Features:** Machine code tutorial, adventures, Memory Map part 3.

#### August 1988 issue:

**Games:** Fox and Geese, Solitaire. **Utilities:** Mini Prolog, disassembler. **Reviews:** E00 ADFS, Repton Thru Time, Barbarian, Romplus-144. **Features:** Machine code tutorial, adventures, Memory Map part 4.

#### September 1988 issue:

**Games:** Fire!, Bulls and Cows, Crypton, Oxo. **Utilities:** Sprite routines, Listit. **Reviews:** Anarchy Zone, Stranded, Round Ones, Times Computer Crosswords, Advanced User Guide. **Features:** Basic rom routines revealed, adventure tips.

#### March 1988:

Machine code maths and sprite print routines, letterhead designer, Shove Penny, Hiss, font output utility, Beer kit handbook.

#### April 1988:

Go-Pig, Dozer Disorder, squashed character sets, sprite print routines.

#### May 1988:

Lion's Lair, Keyboard Gremlins, French to English translator, machine code map display routines.

#### June 1988:

Fibonacci Nim, Bomb Alert, Procedure and function liser, car route database, scrolling map routines.

#### July 1988:

Knockout Whist, Randall Rabbit, Tilley the Train, Tennis, machine code score routines, Easy Reader.

#### August 1988:

Fox and Geese, plus Solitaire board games, Mini Prolog, machine code disassembler.

#### September 1988:

Crypton, Fire, Oxo, Lister, sprite utilities, Listit.

## electron user

### CASSETTES AND DISCS!

Give your fingers a break and save yourself hours of typing by getting these special tapes and discs with all the listings from the magazine ready for you to load and run.



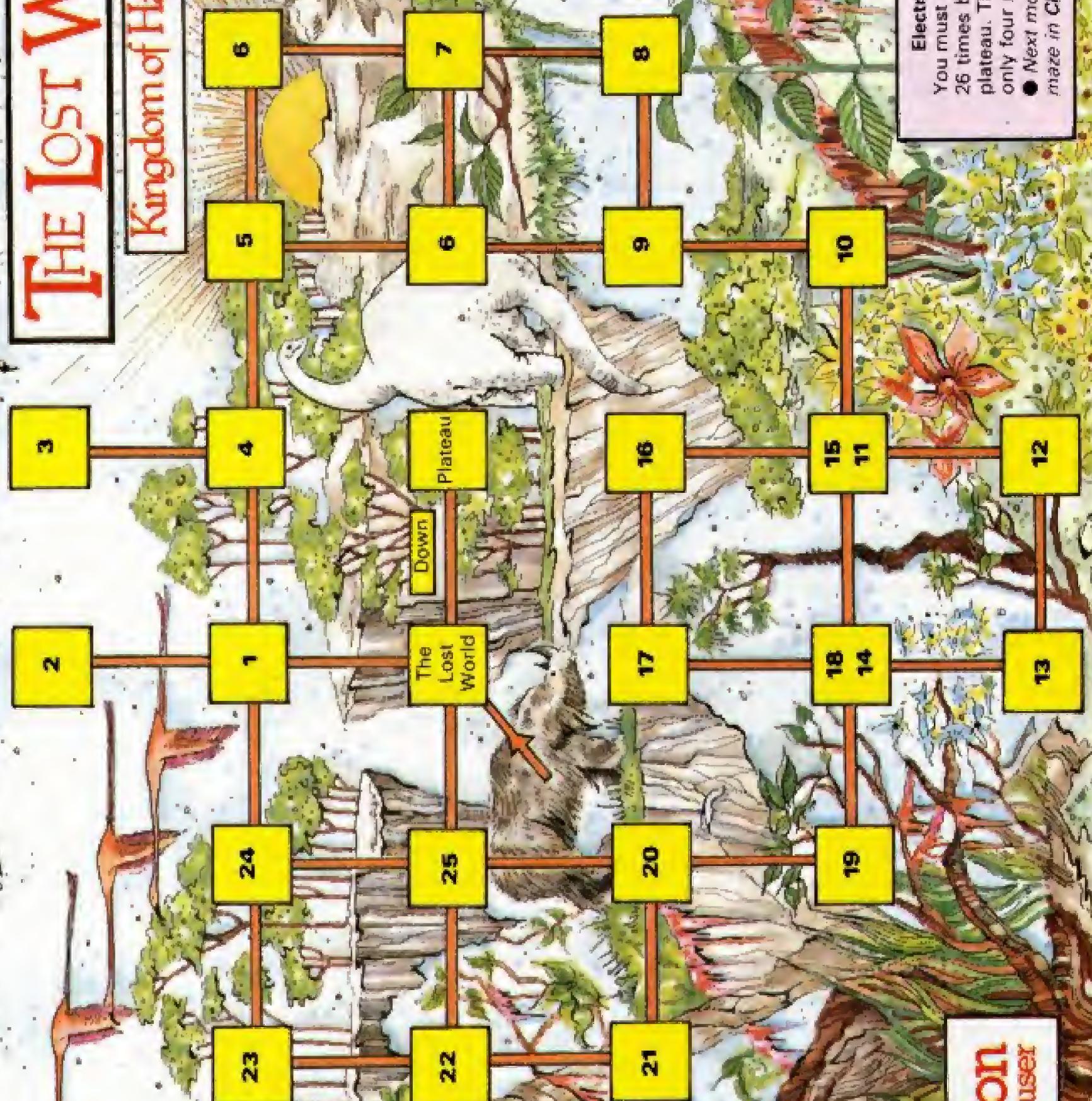
Cassette £3.95  
Disc £4.75

Please note: Yearly subscriptions to the monthly tapes and discs are available and can be obtained via the order form.

**TO ORDER PLEASE USE THE FORM ON PAGE 45**

# THE LOST WORLD

Kingdom of Hamil



## Electron User Maze No. 4

You must stay on the move at least 26 times before descending to the plateau. The Tyrannosaurus Rex is only four moves behind you.

- Next month's map will show the maze in *Classic Adventure*.

**FREE weekend in Paris if  
you complete the game and break  
the code!**

**A new term, a new year**

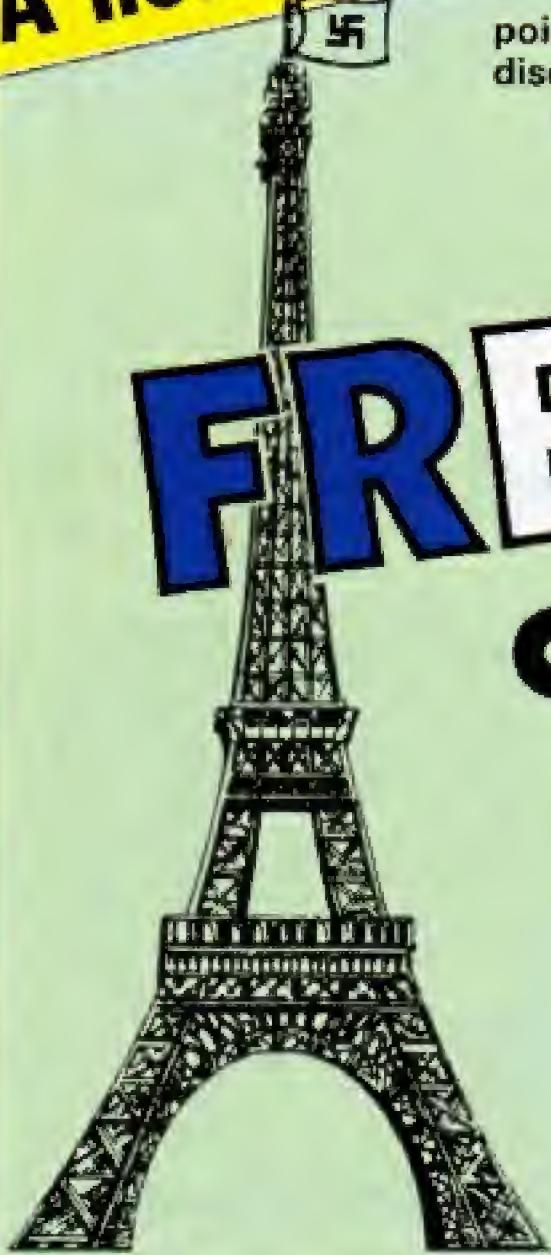
If you're studying French for GCSE

or A-level this year then French on the Run

is just what you need. It is specially designed to teach you the basic points of French grammar and to help you practise interactive discussion. It begins at GCSE standard,

and by the time you get to the end you will be using A-level French!

# FRENCH on the RUN!



**SAVE  
£5**

RRP £9.95 tape  
£11.95 disc

Offer £4.95 tape  
£5.95 disc

**You're on  
your own in  
Occupied  
France –  
facing the  
toughest test  
that a British  
pilot has  
ever had to  
experience!**

The year is 1943. As an RAF officer stranded in Occupied France you have one aim – to get back to Britain.

The only way to do this is to try to pass as a Frenchman, but if your French isn't good enough you risk capture and interrogation by the police or even the Gestapo.

Even the simplest tasks – from buying food to taking buses – place you at risk. And to add to your problems you've got limited funds: "Should I hitch a lift or take the train?", "Do I sell my belongings or get a job?"

Whatever you decide to do, time is short. And there are always people willing to denounce you ...

French on the Run is that rare combination: A truly educational program that's also a thoroughly enjoyable game. This text adventure not only tests your grammar and vocabulary, but your knowledge of France and the French way of life.

And as your French improves the language problems get harder and the situations become progressively more dangerous. There are four routes to complete in sequence – you need the password from the last before attempting the next. The standard of French required is about GCSE, though on the last route it rises to A level standard.

At the specially reduced price of £4.95 on tape, or £5.95 on disc, French on the Run is the ideal inexpensive way for you to brush up your French!

*For teachers: French on the Run uses multi-choice questions with randomised distractors, all carefully chosen to illustrate linguistic points or points concerning things French. The program is meant for individual assessment, but can be used just as effectively for classroom work. A sealed envelope contains details of how the secret passwords are created.*

**Place your order TODAY, using the form on Page 45**

# MICRO MESSAGES

## So let's stop playing games

FLICKING through the August 1988 issue of Electron User I stopped at page four and glanced at the Gallup chart. I was more than a little displeased by what I saw. No less than 12 games in the top 20 were either re-releases or compilation packages.

This leaves eight games, of which three are sports simulations, one an arcade conversion, one part of the never-ending saga of an electronic reptile, and another relying on media hype for sales. The other two are simply variations on a theme.

There is not a single game in the top 20 best sellers at the moment which can claim to be original, or even new. Every one seems to be a re-working of an old, often tired theme.

Who is to blame for this complete lack of originality in game design? Certainly not the software houses, who simply produce what the market demands. No software house in its right mind would release an innovative, original game at the moment, when everyone seems to be clamouring for budget re-releases of ancient titles.

So it is the software buying public who are to blame for the current river of dross flowing from the tape duplicators.

When we stop buying extra copies of games that we already have, and playing the same games that we did a couple of years ago, the software houses may start to think about writing some new games. - Martyn Amos, Newcastle-Upon-Tyne, Northumberland.

### Disc drive or software?

I AM a teacher in a small independent school and am very interested in all the benefits that can be gained from the use of computers by the children. We have a BBC Micro, Compact and Electron in school and are making good use of the first two with their disc drives.

The Electron - won as a prize by a pupil - is not being used as much as it could be mainly because of the time factor as it does not have a disc system yet.

The problem is do we spend over £100 buying a disc drive, or do we use the money to buy essential software for the other machines? Is there enough educational software to make the

upgrading of the Electron worthwhile?

I own an Electron so I am also interested in your reply. Perhaps you could recommend a place of purchase if you advise us to go ahead with the disc drive. - Margaret Leng, Marple Bridge, Cheshire.

● There is a fair amount of educational software around for the Electron, but unfortunately it is almost all on tape, so adding a disc drive wouldn't open up a whole new world of software to use on your micro.

The advantage would be that programs could be exchanged between the BBC Micro or Compact and the Electron by simply swapping floppy discs.

You would probably be best spending the money on software, some of it for the Electron. It should be possible to set up the micro and load the tape-based software before the lesson starts, as it only takes a couple of minutes, then you've got an extra micro to use with the pupils.

### Mini Office WP on disc?

I ONCE saw a letter asking if Mini Office was available on disc. As far as I know it is not, but it is possible to put the word processor on 3.5in ADFS disc.

Copy WORD and WORD1 on to a disc using Roland Waddilove's program from Electron User January 1986. When you want to use the word processor type:

```
LOAD WORD
156 +ADFS
157 +WORD1
RUN
```

Can you help me with a small problem? With the AP3 you receive a Welcome disc. If you insert it and press Control+A+Break then catalogue the disc you will see that the library is set to the Library directory. Please could you tell me how to set my own discs to the desired library using this method? When I use it the library is set to the root directory - S.

Finally, could you recommend an astronomy program? - J. Banks, Earby, Via Colne, Yorkshire.

● You can't transfer the Mini Office word

processor on to disc using this method as the second file WORD1 is locked and the filename contains hidden control codes.

It can be put on disc, but it's not quite as simple as you suggest. The amount of memory free is strictly limited and there's only room for just over 300 words. An E00 ADFS or DFS is required for it to be of any use.

The ADFS always sets the library to Library if such a directory exists on the disc in the root directory. If not, it is set to the root directory itself. This function can't be altered in any way.

We don't know of any astronomy programs for the Electron. Perhaps a reader can help.

### Lost in the jargon jungle

I have been the owner of an Acorn Electron for just over four years. Soon after buying this micro I could get a copy of your magazine from a newsagent in my town, but after about four months I was unable to get a copy.

Until now that is. This month a copy of Electron User did come my way and I started to read it to try to catch up on lost years, but as I turned the pages I was confronted by a whole new list of technical computer jargon which I had previously never met.

Can you explain some of the jargon printed in the pages of Electron User? My problems include the mass of abbreviations used in adverts and articles. Could you tell me what all this means: ADFS disc system, DFS disc system, disc drive including PSU?

Also as I was browsing through the magazine I read not only about the Plus 1 and Plus 3 - of which I am familiar - but also of the Advanced Plus 4, Plus 5 and Plus 6. I am mystified. Please could you tell me what all these add-ons are?

I have decided to buy an Advanced Plus 1 from Pres, and am thinking of buying a Brother HR5 printer. Will the HR5 plug directly into the back of the Plus 1? Does the Advanced Plus 1 give any more memory space than my original Electron? If so, how much, and if not, how can I enlarge my computer's memory?

Finally, in a Slogger advert, and in a letter in micro messages it mentions os 1.0, os 2.0 and os 3.0. Please tell me what this means. - Thomas How, Berkhamsted, Herts.

● How can we hope to cover four years in the small space here in Micro Messages? Briefly, here are the answers to your queries:

When Acorn first produced the BBC Micro it originally had a disc system called the disc filing system, or DFS for short. However, this was quite dated, and better systems with improved performance were available shortly after.

When the Electron came along Acorn was in

Turn to Page 42 ▶

#### From Page 41

the process of converting to a newer system called the advanced disc filing system, or ADFS. This enables you to store much more information on each floppy disc, and use a hierarchical or tree filing structure. Even the very latest Risc chip-based Archimedes uses the same ADFS system as in the trusty old Electron.

The BBC Micro had a power socket into which a disc drive could be plugged. The Electron hasn't got one, so a disc drive must contain its own power supply unit - PSU - as it can't draw any power from the Electron.

The Plus 5 is a triple interface unit that plugs into one of the Plus 1's cartridge sockets. It contains a tube interface, 1MHz bus and a user port. The Plus 6 is an expansion board which fits inside the Plus 1 and enables you to plug in extra roms and sideways ram.

The Brother HR5 works fine with the Electron, and plugs straight into the back of the Plus 1. However, it is a little dated now, and performance-wise isn't too hot. Though this does mean that it can be picked up really cheap if you are prepared to shop around.

The Plus 1 doesn't add any memory to the Electron. The only way to do this is to upgrade with a Slogger Master Ram Board or E2P second processor.

The OS 1.0, 2.0 and 3.0 refer to different versions of an operating system - Slogger's Turbo Master Ram Board in this case.

Finally, if anyone has trouble getting hold of Electron User, let us know immediately - don't wait four years to do it!

## LC10 with the Electron

I HAVE been an avid reader of your magazine since I was advised to buy an Electron late last year, and I have not looked back since. I recently bought a Star LC10 printer to use with my Electron, so I flicked through a friend's back issues of Electron User and pulled out Driver II from the August 1987 issue.

No matter how my friend or I tried we could not get it to work with the LC10. All we get is a lot of beeps from the printer and no underlining, or anything else for that matter. Have any other readers experienced any problems with the LC10, or is it just my lack of programming skills which is at fault? - S.E. Stevenson, RAF Bruggen.

• We haven't used the LC10 with the Electron, so can't really help; we would suspect the listing first before looking at the printer. Check your typing carefully for errors. Can any readers suggest a remedy if it's not the listing, but a hardware fault?

## Rabbit stew

I TYPED in the Randall Rabbit listing in the July 1988 issue of Electron User, but when I ran it, it halted at line 140 after printing RANDALL RABBIT by A Houghton. I then put a STOP at line 135 between PROCgraphics and PROCessem, which again the program reached OK. So I assumed the error was in the assembly procedure, but was

unable to find it. In desperation I ordered the July Electron User tape, and lo and behold, exactly the same problem.

Next I thought that maybe it's because I have Slogger's Master Ram Board and Pegasus 400 disc system, although unlikely, so I tried it on a friend's unmodified Electron with the same result.

Although I thoroughly enjoy Electron User, and have very little to complain about, I have noticed in the last few months with your justifiable boasts of new technology in printing and so on, the errors are creeping in.

Almost every month a correction of one kind or another is published. May I say that like the weathermen, the better the computer programs the less accurate the forecast. Are you able to tell me how to get Randall to run? - D.G.W. Rance, Eltham, London.

• The magazine listing is OK, but unfortunately, a bug crept into early copies of the tape which has

All programs printed in this issue are exact reproductions of listings taken from running programs which have been thoroughly tested.

However on the very rare occasions that mistakes may occur corrections will be published as a matter of urgency. Should you encounter error messages when you type in a program they will almost certainly be the result of your own typing mistakes.

Unfortunately we can no longer answer personal programming queries concerning these mistakes. Of course letters about suggested errors will be investigated without delay, but any replies found necessary will only appear in the mail pages.

now been corrected. If you have a disc system which sets PAGE to &1900 or higher then it will run perfectly. In fact entering:

PAGE=&1900

will enable the tape version to work correctly. A better solution is to load RANDALL and alter line 60, the cause of the problem:

60 IF PAGE<&1901 THEN 110

This skips the downloader which is unnecessary for tape-based or E00 ADFS and DFS Electrons like yours.

## Yukky Egg

I HAVE been one of the many people who have subscribed to your excellent magazine for some time now. I have an Electron Plus 1 and greatly enjoyed the earlier of your Hardware Projects series, though I have little need for a weather station, and not enough time or cash for a buggy. I still enjoy interfacing and think you should have a regular article devoted entirely to the analogue port.

Having a smallish system, I greatly envy those with larger ones, as sometimes I am unable to use some of your utilities. Is there some way of using Snap Shot without a disc drive?

I would like to bring your attention to what I

consider to be a bit of a con - 21st Software advertises Chukie Egg as suitable for the Electron. OK, so it loads and the game works, but without a Turbo Driver or Master Ram Board it'll take a real expert at the game at least a century to get past the first screen. That is, it runs too slow. - Henry Coles, Keighley, West Yorkshire.

• Snap Shot was designed to be used with a disc system, but you could try it with tape by first disabling cassette messages with 'OPT1.0'.

It sounds like you have the BBC Micro version of Chukie Egg, as the game we have is very fast and addictive - our resident arcade games freaks can get past level 20! The Electron version runs in Mode 5, but the BBC Micro version runs in Mode 2, so count the number of colours on screen, and if there's more than four you've got the wrong game.

## Routine collision

HELP! I am trying to write a simple game at the moment, but I can't come up with a satisfactory collision detection routine. Can you?

When I was programming it I needed to be able to centre text across the screen on any given horizontal line, so I came up with this short but effective utility:

```
10 INPUT WHICH MODE:MS
20 MODE MS
30 PROCentrel("This is centred",5)
40 END
50
60 DEF PROCentrel(a$,tab)
70 PRINT TAB((2&384+1-LEN a$)DIV 2,
tab)a$
80 ENDPROC
```

Something I could not work out though, was how to print 80 characters per line in Mode 6. A utility published in Electron User in the April 1988 issue only worked in Modes 1, 2 and 5. Is it possible in Mode 6? - David Lloyd, Broadstone, Dorset.

• There are many different ways of detecting collisions. One possible method for Pac Man type games is to compare the X,Y coordinates of the man and monsters. If one of the monsters has the same coordinates as the man then it has gobbled him up.

Another method is to use the POINT function to return the colour of the pixel just in front of the man. If it is greater than zero then he has hit an object - perhaps a wall.

It is possible to print 80 column text in Mode 6, but it is quite a tricky piece of programming and we haven't the space to go into it here. Briefly, one way would be to first design a character set four pixels wide and eight high, then poke the character data straight into the screen memory map.

## Database will not extend

AT the moment I am in the process of writing a database program on my Electron to use in conjunction with my Pegasus 400 disc drive system using PRINT# and other such commands.

However, I am having a few problems, the first being with a Can't extend error message. If I save one database file to disc and then save another I can't go back to the first one and add more information. Is there any way round this?

My second problem is with the No room error. I have tried raising HIMEM to its maximum value, but I'm afraid that it won't take me long to fill this extra memory. I also tried lowering LOMEM, but this corrupted my program and lots of weird and wonderful things happened. What else can I do?

Another problem I have encountered is the Bad mode at line xx error message. I have checked my program and HIMEM isn't less than LOMEM, and I certainly haven't changed mode inside a procedure or function. Does this mean I have used up all the available memory? My program is 9043 bytes long and executes in Mode 1.

My last problem concerns printing out my records. Unfortunately I don't own a printer yet and haven't access to one. Could you tell me if the following lines will print the variables a, b and c on paper?

```
10 *F13,10
20 PRINT a,b,c
```

— J. Hare, Thornaby, Cleveland.

● The Can't extend error message is a problem with the disc filing system - DFS - but not the advanced disc filing system - ADFS. It occurs when one file is saved on the disc immediately followed by another. The first one can't be made any bigger because it wouldn't then fit into the space currently occupied.

It may be helpful to imagine recording a 30 minute program on your video followed by another 30 minute one. Now try extending the first one and squeezing a 45 minute program in - it simply can't be done as there's only 30 minute's worth of tape.

The solution is to leave a big enough space so that you can fit in as big a file as you are ever going to need. On a blank disc enter:

```
10 INPUT"How many bytes";BT
20 FT=OPENOUT "DATA"
30 PTR#FT=BT
40 CLOSE#FT
```

To allocate 8% bytes of space to a file called

DATA. If you save another program on this disc you'll only get the Can't extend error message if you try to write more than 8% bytes to the file. (This isn't quite true as 16k blocks of disc space are allocated to files that are opened).

Your other problems can be cured by running the program in Mode 4 or 6 instead of Mode 1. Mode 6 will give you an extra 12k of memory. Even though HIMEM may be well above LOMEM you can still run out of room as Basic's stack grows down from HIMEM and its heap grows up from LOMEM. When these two structures approach each other too closely you run out of memory.

Don't lower LOMEM as you'll corrupt your program as you found out. Your two line program will correctly display the three variables on the printer.

## Tails from the crypt

I TYPED in Crypton from the September 1988 issue of Electron User and found it to be an excellent game. After struggling for several hours I finally managed to complete the first two screens, but on the third I got an error message - Out of data.

Looking at the data statements in the listing the last line seems to have too few items. Has the tail end of this been chopped off? — Adam Brown, Altringham, Cheshire.

● Yes, you are right - there should be another four characters which somehow disappeared off the page. The game will run correctly until you come to the third screen. Here is the complete last line:

```
1380 DATA1113111311101001424004000
0024,1141114111411141001034024000024
4,49,49,48
```

## Vote of confidence

I AM the proud owner of an Electron, to which I have added a Plus 1, over 50 software cassettes, and plan to add a Plus 3, Slogger's Picasso pack-

age, word processor and printer. Don't worry about the format of Electron User - it is fine as it is. — Nick Rapson, Egguckland, Plymouth.

## Sketchy designs

WHERE would I be able to buy a replacement X key for my Electron? At the moment I am using the Escape key in the X position, but the micro looks weird without it in its normal position.

On the introductory cassette is an excellent program called Sketch which my two sons use to create designs, doodles and so on. Would it be possible for you to print in Micro Messages a listing which could be included somewhere in the program to enable them to save their pictures on a separate tape? — R.B. Lee, Harrogate, North Yorkshire.

● We don't know of anyone who supplies keys for the Electron. Can any readers help? Here are the modifications to the Sketch program: First load the program - don't chain it - and enter:

```
10,70
20,460
30 *OPTT,B
241 IF AKEY%=&HSCLT THEN *LOAD SCREEN
242 IF AKEY%=&HSCLS THEN *SAVE SCREEN
3000 3000
```

To save a picture press S, and to load one press L. You won't see any cassette messages so make sure there is a blank cassette in your recorder and Play and Record are pressed when saving, and just Play when loading.

## Little is not enough

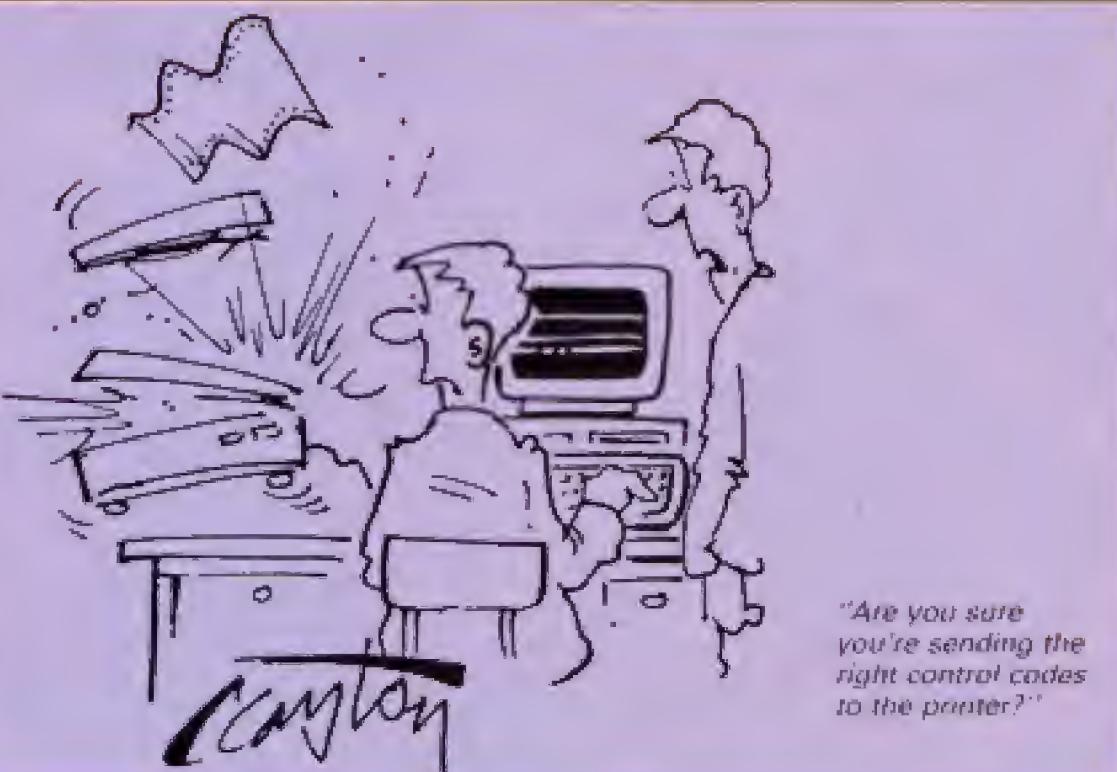
PLEASE can you tell me how to write the following Basic program Screen Print in assembly language:

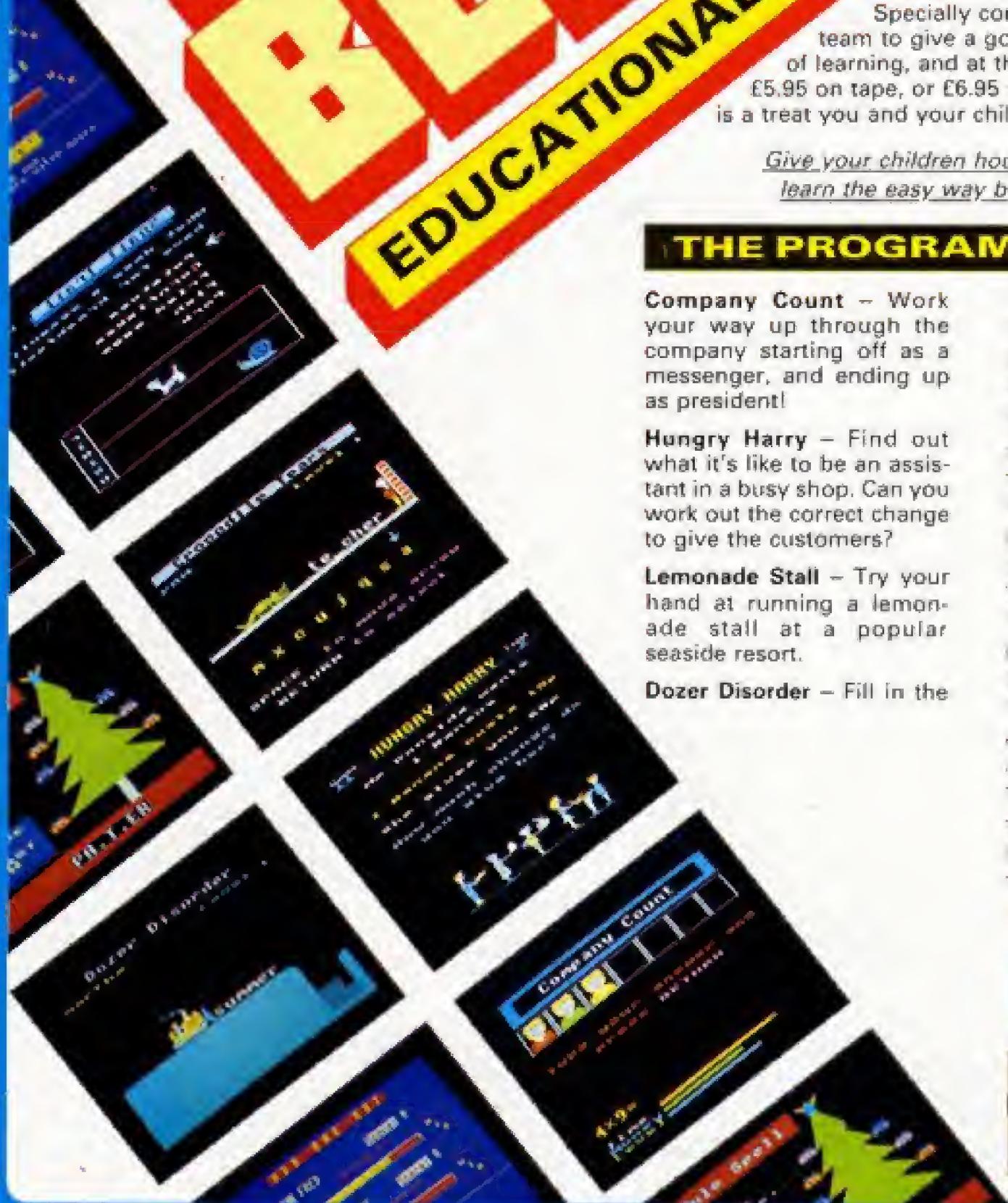
```
10 MODE 5
20 FOR screen=85800 TO 87FFF
30 I$screen=148
40 NEXT screen
50 END
```

I know a little machine code - but not enough. — Peter Raymond, Harlow, Essex.

● Here's the answer to your problem:

```
10 FOR pass=0 TO 2 STEP 2
20 P%=&900
30 C OPT pass
40 LDA =&800
50 STA &870
60 LDA =&858
70 STA &871
80 .Loop
91 LDA =&148
100 STA (&870),Y
110 INT
120 ONE Loop
130 INC &71
140 LDA &71
150 BPL Loop
160 RTS
170 I
180 NEXT
190 CALL &900
```





Packed full of some of the best educational games from the pages of *Electron User*, the new Ten of the Best Educational Games is the ideal way for your children to learn about maths, spelling, anagrams, telling the time, general knowledge, and even the rudiments of running a business!

Specially compiled by the *Electron User* team to give a good grounding in all aspects of learning, and at the very special price of only £5.95 on tape, or £6.95 on 3.5in disc, this collection is a treat you and your children cannot afford to miss!

*Give your children hours of fun, and help them to learn the easy way by ordering your copy today.*

### THE PROGRAMS

**Company Count** – Work your way up through the company starting off as a messenger, and ending up as president!

**Hungry Harry** – Find out what it's like to be an assistant in a busy shop. Can you work out the correct change to give the customers?

**Lemonade Stall** – Try your hand at running a lemonade stall at a popular seaside resort.

**Dozer Disorder** – Fill in the

missing letters after they are bulldozed into a pit.

**Crocodile** – Unscramble the letters of a word before the crocodile gets you.

**Snail Trail** – See how good you are at general knowledge in this trivia quiz.

**Hiss** – Improve your spelling by guiding a snake round the garden eating up words in the right letter order.

**Maths Fun** – Test your powers of mental arithmetic.

**Odd One Out** – Pick the object that doesn't fit from the list of five.

**Yule Spell** – Guess the hidden word or you'll lose your Christmas presents!

Tape      Disc  
**£5.95    £6.95**

Order your copy today, using the form on Page 45

All prices include postage, packing and VAT  
Overseas orders sent exclusively by Air Mail

**Annual subscriptions****MAGAZINE**

	UK £15	3001	NEW	3002	RENEWAL
Europe (inc. Eire)	£23	3003		3476	
Overseas	£38	3004		3477	

Commence with \_\_\_\_\_ issue

**CASSETTE AND DISC**

(see page 24)

	Cassette £25	3005	NEW	3006	RENEWAL
3.5" Disc £40	3500			3501	

Commence with \_\_\_\_\_ (state month)

Add £10 for Europe and Eire/Overseas

**CASSETTE/DISC AND MAGAZINE (UK only)**

(see page 24)

Cassette + Magazine £35	3005/3001	
3.5" Disc + Magazine £50	3500/3001	

Commence with \_\_\_\_\_ (state month)

Get either of  
these for only  
**99P each**  
when you  
subscribe

Icarus Cassette	3055	
TV Splitter	3056	

**Education Special Vol. 2****Classroom Computing on the Electron**

Magazine + Electron Cassette	£3.95	3007	
Magazine + Electron 3.5" Disc	£4.95	3008	

Add £2 for Europe (inc Eire); £4 for Overseas

**Fun School**

(see page 30)

	Ages 2-5	3080/3108	Tape £4.95	3.5" Disc £5.95
	Ages 5-8	3081/3109		
	Ages 8-12	3082/3110		

Add £1 for Europe/Overseas

**Electron User back issues**

(see page 38)

E1.75 UK	January 1988	3222	
£2.75 Europe inc. Eire	February 1988	3223	
£3.75 Overseas	March 1988	3224	
	April 1988	3225	
	May 1988	3226	
	June 1988	3227	
	July 1988	3228	
	August 1988	3229	
	September 1988	3230	

**Electron User tapes/discs**

Tape £3.95, Discs £4.75. Add £1 for Europe/Overseas

	Jan 1988	3222/3422	Tape 3.5" Disc
Cosmic Guerrillas	Feb 1988	3223/3423	
Super Digga	Mar 1988	3224/3424	
Shove Penny	Apr 1988	3225/3425	
Go-Pig	May 1988	3226/3426	
Keyboard Gremlins	June 1988	3227/3427	
Bomb Alert	July 1988	3228/3428	
Carrot Quest	Aug 1988	3229/3429	
Fox and Geese	Sept 1988	3230/3430	
Crypton	Oct 1988	3231/3431	

Readers in Europe (inc Eire) add £2, Overseas add £5 per item unless otherwise indicated

Send to: Database Publications, FREEPOST,  
Macclesfield, Cheshire SK10 4YB

(No stamp needed if posted in UK) Please allow 28 days for delivery

Order at any time of the day or night

Telephone Orders: 0625 879920

Fax Orders:  
0625 879956Orders by Prestel:  
Key 180, then 514568383Microlink/Telecom Gold  
72-MA 0001

Don't forget to give your name, address and credit card number

ENQUIRIES ONLY: 0625 879940 9am-5pm

Valid to October 31, 1988  
Please enter number required in box

**The Sound Master****SPECIAL**

Ep

£9.95 3000

Add £2 for Europe (inc. Eire); £7 for Overseas

**Arcade Game Creator**

(see page 24)

Tape	£3.95	3118
3.5" Disc	£4.95	3127
5.25" Disc	£4.95	3010
	£8.99	3054

Pack of 6 magazines (Feb-July, 1988)

Add £1 for Europe/Overseas

**Adventure Anthology**

Add £1 for Europe/Overseas

Tape £4.95 3044

**Knitwear Designer**

Tape £8.95 3128

5.25" Disc £9.95 3129

Add £2 for Europe (inc Eire); £5 for Overseas

**Nursery Rhymes**

(see page 22)

Tape £5.95 3018

3.5" Disc £6.95 3019

Add £1 for Europe/Overseas

**Mini Office**

(see page 52)

Tape £5.95 3062

Add £1 for Europe/Overseas

**Ten of the Best Series**

GAMES Volume 1 3068/3111

Volume 2 3069/3112

Volume 3 3070/3113

Volume 4 3120/3121

NEW EDUCATIONAL PROGRAMS 3063/3066

(see page 44)

Add £1 for Europe/Overseas

**French on the Run**

(see page 40)

Tape £9.95 3115

Add £1 for Europe/Overseas

**Micro Olympics**

Tape £5.95 3014

Add £1 for Europe/Overseas

**Classic Card and Board Games**

No. 1 Tape £5.95 3090

3.5" Disc £7.95 3092

No. 2 Tape £5.95 3091

3.5" Disc £7.95 3093

Add £1 for Europe/Overseas

**Electron dust cover**

£3.95 3058

Add £1 for Europe/Overseas

**Magazine binder**

£3.95 3059

Add £3 for Europe (inc Eire); £7 for Overseas

**Books**

(see page 27)

Advanced User Guide £2.95 3072

Getting Started in BBC Basic £2.95 3100

Electron Assembly Language £2.95 3060

All three books £7.95 3061

Add £1 for Europe/Overseas per book

Payment: please indicate method (✓)

Expiry

Date

 Access/Mastercard/Eurocard/Barcilaycard/VisaNo.     Cheque/Eurocheque made payable to Database Publications Ltd.Name  Signed Address Post Code Tel 

EU10

# Software at Bargain

## LATEST TITLES

Spycat .....	£7.50
Repton thru Time .....	£5.50
Barbarian .....	£7.50
Saigon .....	£7.50
Play it again Sam II .....	£7.50
Shark .....	£7.50
Breakthrough .....	£7.50



### ACORNSOFT TITLES

Talkback .....	£1.50
Workshop .....	£1.50
Sphinx Adventure .....	£1.00
Starship Command .....	£1.00
Hopper .....	£1.00
Chees .....	£1.00
Desk Diary .....	£1.00
Business Games .....	£1.00
Boxer .....	£1.00
Me and My Micro .....	£1.00
Snapper .....	£1.00
Complete Cocktail Maker .....	£1.00
Watch Your Weight .....	£1.00
Linkword Italian .....	£2.25
Linkword Spanish .....	£2.25
Turtle Graphics .....	£2.25
Advanced User Guide .....	£3.25
Usp .....	£1.99

### BUDGET TITLES

Pengwyn .....	£1.99
Xanagrams .....	£1.99
Stock Car .....	£1.99
Mini Office .....	£4.95
Dog Fight .....	£2.99
Combat Lynx .....	£2.99
Warehouse .....	£2.99
Cascade (50 Games) .....	£2.99
Daredevil Dennis .....	£1.99
Snooker (Steve Davis) .....	£1.99
Tarzan (Martech) .....	£2.99
Football Manager .....	£2.99
Microvalue 1 .....	£3.99
Microvalue 2 .....	£3.99
Microvalue 3 .....	£3.99
Grid Iron .....	£1.99

### CURRENT TITLES

Elite .....	£9.95
Palace of Magic .....	£7.50
Bonecruncher .....	£7.50
Last of the Free .....	£3.99
Acornsoft Hits 1 .....	£3.99
Acornsoft Hits 2 .....	£3.99
Five Star Games Vol 3 .....	£7.50
10 Computer Hits Vol 4 .....	£7.50
Life of Repton .....	£5.50
Omega Orb .....	£6.25
Dispatch Rider .....	£6.95
Ransack .....	£7.50
Ziggy .....	£6.95
Impact .....	£7.50
Graham Gooch Cricket .....	£7.50
Play it again Sam .....	£7.50
Collosus 4 Chess .....	£7.50
Superior Hits Vol 3 .....	£7.50
Around World 40 Screens .....	£5.50
Paper Boy .....	£7.50
The Lost Crystal .....	£9.95
The Hunt .....	£7.50
Village of Lost Souls .....	£7.50
Spitfire 40 .....	£7.50
Spy v Spy .....	£7.50
Brian Clough Football .....	£12.50
Five Star Games Vol 1 .....	£7.50
Five Star Games Vol 2 .....	£7.50
10 Computer Hits Vol 2 .....	£7.50
10 Computer Hits Vol 3 .....	£7.50
Winter Olympiad '88 .....	£7.50
Star Wars .....	£7.50
Quest .....	£7.50
Spycat .....	£7.50
Boulderdash .....	£7.50
Indoor Sports .....	£7.50
Phantom Combat .....	£2.99
Repton II .....	£2.99
Karate Combat .....	£2.99

### IVAN BERG SERIES

English CSE/GCE .....	£2.00
Biology CSE/GCE .....	£2.00
Maths 1 CSE/GCE .....	£2.00
Maths 2 CSE/GCE .....	£2.00

NEW                          NEW

Summer Olympiad Tynesoft .....	£7.50
Round One Alternatives .....	£1.99
Anarchy Zone Atlantis .....	£1.99

### ROM CARTRIDGES

View (Wordprocessing) .....	£11.95
Viewsheet .....	£11.95
Usp .....	£7.75
Logo .....	£28.50

### EPIC ADVENTURES

Wheel of Fortune .....	£4.95
Castle Frankenstein .....	£4.95
Quest of the Holy Grail .....	£4.95
Kingdom of Klein .....	£4.95



**TOWERHILL COMPUTERS LTD**  
Unit 5, Acacia Close, Cherry Court Way Ind. Est.  
Leighton Buzzard, Beds.

Telephone: Leighton Buzzard (0525) 385329



# Prices

## **BUGBYTE AT £2.75 EACH**

Uranians  
Hunkydory  
Tennis  
Savage Pond  
Cricket  
Starforce  
Ice Hockey  
Twin Kingdom Valley  
Jack Attack  
Temptation  
Dunjunz  
Squeakalizer  
Sky Hawk  
Plan B II



## **ALTERNATIVES AT £1.99**

Dead or Alive  
Mineshaft  
Video Pinball  
Microball  
Rik the Roadie  
Soccer Boss  
Olympic Spectacular  
Crazeer Erbert  
Licence to Kill  
Confusion  
Night Strike

**CDS BLUE RIBBON AT £1.99**  
Bar Billiards  
Mango  
3D Dotty  
Trapper  
Return of R2  
Video Card Arcade

<b>ATLANTIS</b>	
League Challenge	£2.99
Survivors	£2.99
Panic	£1.99
Cops and Robbers	£1.99
Creepy Cave	£1.99
Pro Golf	£2.99



## **Bargains of the Month**

Pedro	£1.99
Xor	£3.50
Elixir	£6.00
Spellbinder	£6.00



## **SUPERIOR at £1.99 each**

Fruit Machine	Percy Penguin
Invaders	Alien Dropout
Draughts	World Geography
Reversi	Centi Bug
Stranded	Zany Kong Junior
Mr. Wiz	Overdrive
Chess	Tempest
Smash 'n' Grab	Death Star
Repton I	

**ALL PRICES INCLUDE V.A.T. AND P&P.  
OVERSEAS ORDERS ADD £1.00**

## **MITHRAS SOFTWARE**

Best selling software for your Electron at Bargain prices  
New titles available from day of release

	R.P.	Ours		R.P.	Ours
Play it Again Sam Vol 3	9.95	7.50	Tetris	8.95	4.95
Shark	9.95	7.50	Skirmish	9.95	4.95
Breakthrough	9.95	7.50	Kourtyard	9.95	4.95
Pipeline	9.95	7.50	Ziggy	8.95	4.95
Summer Olympiad	9.95	7.50	Quest	9.95	6.95
Winter Olympiad	9.95	7.50	Elair	9.95	5.95
Indoor Sports	9.95	7.50	Palace of Magic	9.95	5.95
Repton Ima Time	6.95	5.50	Xor	9.95	5.50
Life of Repton	6.95	5.50	Evening Star	9.95	6.95
Around World in 40 Screens	6.95	5.50	Spitfire 4G	9.95	5.50
Icarus	9.95	7.50			
Barbarian	9.95	7.50			
Saigon	9.95	7.50	<b>ADVENTURELAND</b>		
Spycal	9.95	7.50	The Lost Crystal	11.95	9.95
Star Wars	9.95	7.50	The Hunt	9.95	7.50
10 Computer Hits Vol 4	9.95	7.50	Village of Lost Souls	9.95	7.50
Five Star Games Vol 3	9.95	7.50	Project Thesus	9.95	7.50
Bonafuncher	9.95	7.50	Myoem	9.95	7.50
Spellbinder	9.95	7.50	Kayleth	7.95	6.95
Despatch Rider	8.95	6.95	Osbridge	7.95	5.25
Play it again Sam	9.95	7.50	Wheel of Fortune	5.95	5.25
Play it again Sam Vol 2	9.95	7.50	Gaste Frankenstein	4.95	4.50
Superior Collection Vol 3	9.95	7.50	Quest of Holy Grail	4.95	4.50
Boulderdash	9.95	7.50	Kingdom of Klein	4.95	4.50
Paper Boy	9.95	7.50	Rising of Salandra	-	4.50
Spy vs Spy	9.95	7.50	The Nine Dancers	-	3.65
Colossus Chess	9.95	7.50	The Puppet Man	-	3.65
Football Manager	-	2.95	Hex	-	3.65
Soccer Boss	-	1.99	Wychwood	-	3.65
Steve Davis Snooker	-	1.99	Twin Kingdom Valley	-	2.95
Plan B2	-	2.95	Stranded	-	1.95
5 Computer Hits	-	2.50	Perseus and Andromeda	-	1.95
Micro Muesli Vol. 1, 2, or 3 each	-	3.65	Escape from Pulsar 7	-	1.95
Codename: Droid	-	10.95	The Wizard Akyrz	-	1.95
		10.95	Waxworks	-	1.95
			The Golden Baton	-	1.95
<b>DISCS</b>	<b>5.25"</b>	<b>3.5"</b>	Circus	-	1.95
Bonafuncher	9.50	-	Arrow of Death	-	1.95
Spellbinder	9.50	-	Ten Little Indians	-	1.95
Elixir	-	10.95	The Time Machine	-	1.95
Play it Again Sam	9.50	10.95	Scott Adams Scroos (3 adv)	-	1.95
Palace of Magic	9.50	10.95	The Quill	-	12.95

A full list of our Electron titles is sent with each order

ALL PRICES INCLUDE VAT & P&P IN UK. ORDERS NORMALLY DESPATCHED WITHIN

24 HOURS OF RECEIPT BY FIRST CLASS POST BUT PLEASE ALLOW 7 DAYS

(Orders to Europe and Eire add 50p for each item. Worldwide add £1 for 1st and 50p for each other item. Please send cheque payable through a UK bank or give full details of your Visa, MasterCard or Eurocard).  
Please quote Electron (A BBC list is available on request) and send cheque, P.O.

Access or Visa number and cardholders name to



**MITHRAS SOFTWARE**  
PO Box 151, Maulden, Bedford, MK45 2YH  
Tel: (0525) 402630



## **GIANT COMPUTER SALE**

Acorn Electron	£29.99
Ferguson G/S Monitors	£39.00
C2M Cassette	£19.99
Electron Printers JP101	£79.99
Atari XL65	£49.00
Amstrad printers from	£69.00
Spectrum 128	£49.99
Commodore 64	£79.99
Spectrum Plus 2	£119.00
Spectrum Plus 3	£179.00
Acorn Plus 1	£29.99

- Huge savings on all Amstrad 16/vip Machines
- Prices include VAT. P&P is £7 Extra
- All computers unless otherwise stated are ex-demo/shop soiled

**RDS Ltd**  
157-161 Kingston Road.  
Portsmouth  
Telephone:  
0705 812478

**Techno Trace**  
167 West Street  
Fareham  
Telephone:  
0329 234199

# Good quality port

In the August 1988 issue of *Electron User* we looked at some of the useful lines brought out in the Plus 1's rom cartridge port. In our first project using this multi-function port we'll initially look at a useful control line, then get down to building an I/O port.

We've seen how the Electron can access add-ons at particular locations in its memory map by using the address lines, and transfer data between the CPU (central processor unit) and the add-on using the data lines. These data lines are rather special as they can carry information in two directions - either towards or away from the CPU.

So data is read from a rom cartridge plugged into the port, but if we had a peripheral such as a user port plugged in it would be possible for data to be transferred in both directions between add-on and CPU.

Whenever the CPU issues a READ instruction, the data lines are prepared for input and a pin called R/W is set high. This signals to a memory address, be it used for ram, rom or the control of an add-on device, that a READ is taking place. It is then up to the device accessed to put a byte on the data lines for the CPU to read. If a write operation is to be performed, the R/W pin is taken low.

The R/W signal is made available in the cartridge port at pin A4, and is an output from the CPU - which is at 5V when reading and 0V when writing information. The R/W line is what is called a control line, as it is used by the CPU to control the rest of the system.

The final connection in the cartridge port that we will require for our first project is called ROMOE. If we were to simply use the nPGFD and R/W lines to control our I/O port, we would get some rather odd results. This is because of the way in which the Electron hardware is arranged.

## Joe Pritchard continues his investigation of the Plus 1's two built-in rom cartridge ports

Due to the timings of the different control signals, it's possible for a peripheral to be addressed by the Electron when it's not intended. The ROMOE can be used to reduce this tendency.

### A simple I/O port

This project is an input/output port which will allow the Electron to read up to eight bits of digital information from the outside world, which could come from electronic circuits, switches, LDRs and so on, and control other electronic devices using eight output lines.

This month I'll describe the output side of things, and show how you can build a working input port. Next month we'll add the extra components needed for the output port. Building the circuit in two parts like this allows us to check the two parts separately and get each one working in turn - a much better proposition than trying to cure faults in a large circuit.

Figure 1 shows the input port's circuit diagram. It is the most complex add-on we've built yet, and uses three logic chips. IC1 is used for address decoding. When we add devices to a computer, we must ensure that the add-on knows when the computer is requesting a byte from it or when it's going to be sent a byte by the computer. This is done by putting the address of the external circuit on to the address lines.

Then the circuit must recognise that it is being

addressed by the computer, a situation arrived at by combining the address line signals so an output signal is only generated when the address of the device is on the address lines.

In a perfect world we would combine all 16 address lines and an output signal would only be given for one specific address present on the address bus, the actual address depending upon how the address lines were combined together. This is called full decoding. Alternatively, only a few address lines might be combined together giving an output signal for a range of addresses on the address bus resulting in partial decoding.

In this design I'm using partial decoding and the nPGFD line is used to select the address, which will be any location in page &FD of the Electron's memory map. Any other hardware using this page, must then be disconnected before connecting up this circuit.

The nPGFD gives a zero output whenever page &FD is accessed by the Electron, whether for read or write operations. For the output port, we're only interested in writing data to it, so it's clear that we need to use the R/W line in some way to detect when a write operation is taking place. This line goes to logic zero whenever a write takes place.

IC1 and IC2 are used to generate an output signal to IC3 whenever the correct combinations of control signals are obtained from the cartridge port. We can then use this output, often called a select signal, to control IC3, the output latch, via pin 11. The 74LS373 chip is responsible for putting signals from the data bus of the Electron on to the output lines D0 to D7.

While the select signal is at logic one the output lines reflect the value of the input data lines. However, as soon as the select signal is zero the output is frozen at the last value that was on the

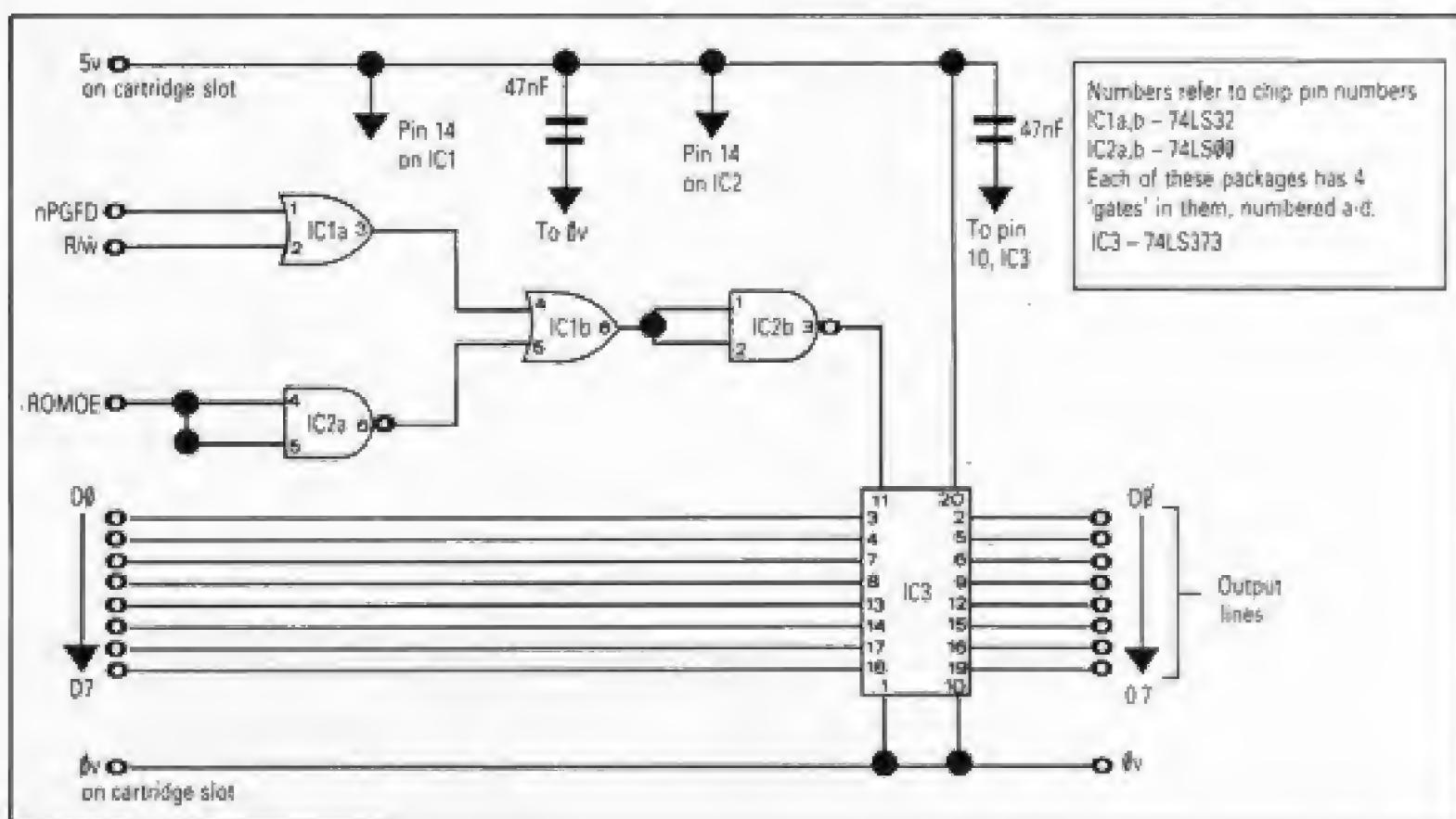


Figure 1: The input port circuit diagram

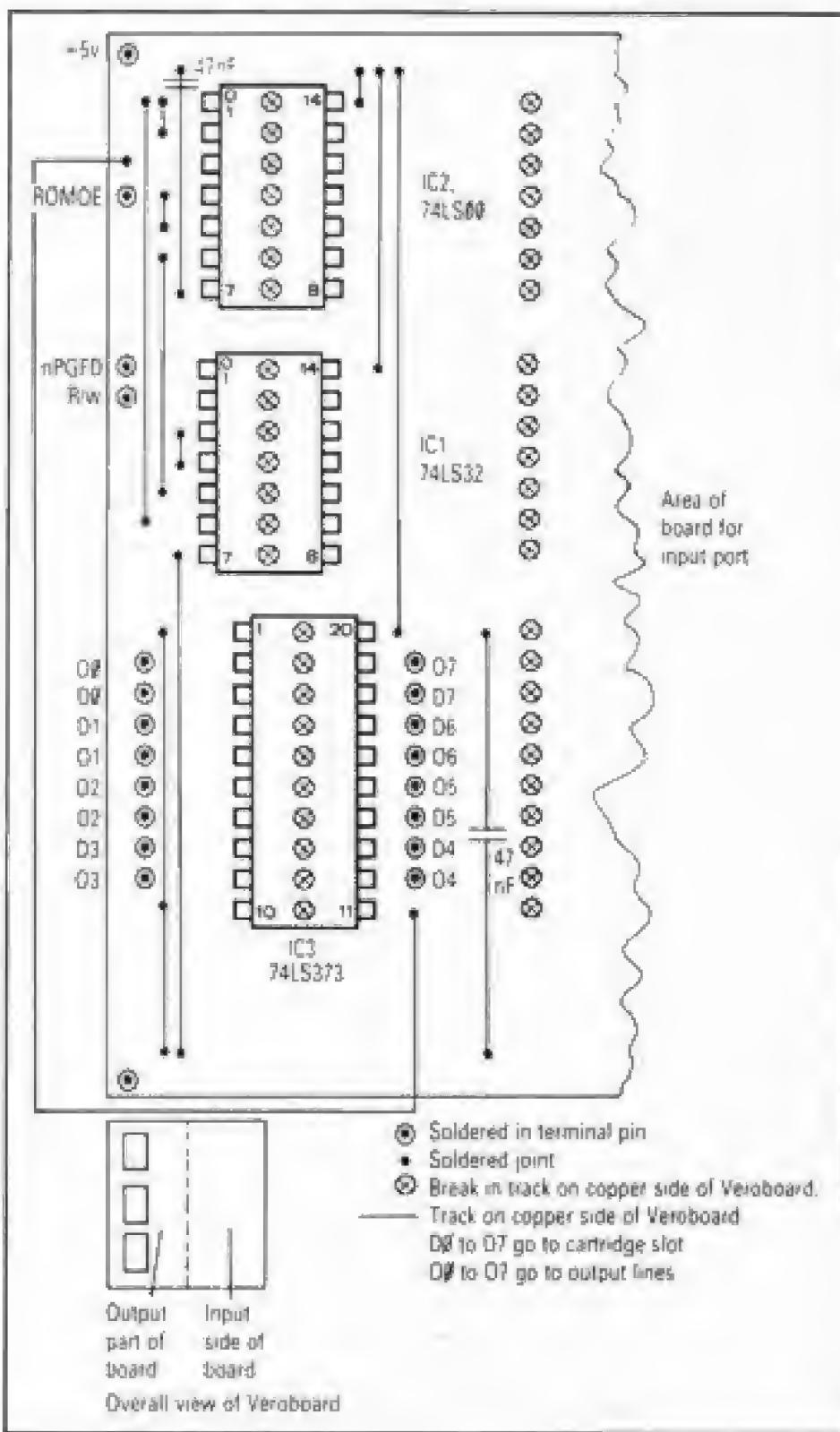


Figure II: Layout for output port

data lines. Thus we need to arrange things so that the select line to the LS373 is usually low but goes high when we want to write a byte of data to the output port. This is done by the arrangement of OR and NAND gates in IC1 and IC2.

Thus a ? command from Basic or an STA from assembler will store a value in the output port, which will remain there until an address in the range FD00 to FDFF is written to again.

The select signal is actually an electrical pulse, and on occasions such pulses can cause the computer to crash. For this reason, 47nF ceramic capacitors are connected across the power supply pins of the two integrated circuits.

Figure II shows the veroboard layout for the circuit. We use a fairly large piece so as to leave plenty of room for the input part of the circuit. Take care to cut the tracks where an x is marked on the diagram, and ensure there are no short circuits between tracks or between the pins on the integrated circuits.

It is best to use sockets for the integrated circuits - 14 pin ones for the 74LS00 and 74LS32 chips and a 20 pin socket for the 74LS373 chip. When assembling the circuit, insert the wire links

and the sockets first, followed by the veropins, then the ceramic capacitors.

All the components, with the exception of the connector for the cartridge, are available from stockists such as Rapid Electronics, Electromail or any of the other mail order component companies. Make sure that you buy 74LS type logic

**OR and NAND gates**

An OR gate, as found in the LS32 chip, is quite simple. If either of its two inputs are set to one, then the output will also be a one. We can write:

Input 1	Input 2	Output
0	0	0
1	0	1
0	1	1
1	1	1

This is called the truth table of the OR gate. The NAND gate is a little more complex.

Input 1	Input 2	Output
0	0	1
1	0	1
0	1	1
1	1	0

As you can see, the NAND gate output is equal to one as long as the inputs are not all equal to one. In the NO circuit, we connect the two inputs together. In this case, Input 1 will be the same as Input 2, and so we can simplify the above down to:

INPUT	OUTPUT
0	1
1	0

This process is called inversion. See if you can use the truth tables above to work out what outputs are required from the cartridge port to allow the latch to put the contents of the data bus on to the latch output lines.

chips; the 74 series device, without the LS in the part number, is not suitable for this circuit.

The double-sided edge connector used to connect the circuit to the cartridge port is available from Electromail, part number 468-709; it is

**Turn to Page 50 ►**

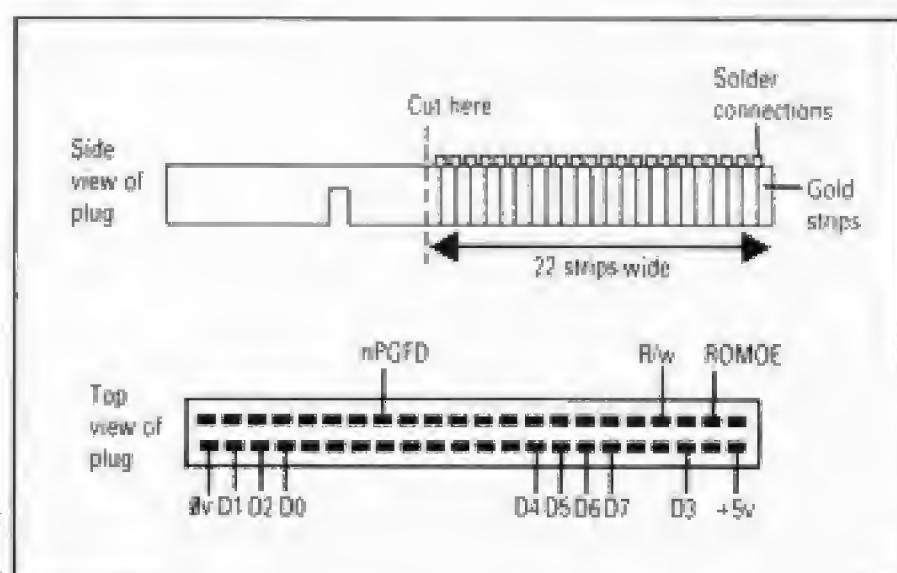


Figure III: Connections to plug

#### From Page 49

described as a 0.1in 43 way double sided edge plug. You'll need to cut it to size, removing the end with the notch in it to give you a 22 way connector.

Count from the end without the locating notch in it, then cut the connector carefully using a hacksaw between the gold edge connectors. Use a file to smooth down the cut end.

The ribbon cable can then be soldered directly to the connections on the strip. Don't solder this while it is plugged in to the Electron, even if the micro is turned off.

Once you've soldered the ribbon cable into place, and after carefully checking it, you may like to use epoxy resin to glue the ribbon cable to the plug as well to give extra support. Again, make sure there are no short circuits between pins.

#### Final stages

The final part of the construction lies in joining the ribbon cable from the edge connector to the veropins on the circuit board. The ends of the ribbon cable should be bared and twisted around the veropins before being soldered to get a good mechanical joint.

The veropins marked output are for outgoing electrical signals. You could use a variety of connectors here - I'll look at some of them in detail next month. For now though, simply wire up the

circuit shown in Figure IV. This will be used to test the output port, and you should temporarily connect the resistors to the D0 to D7 lines.

Check all wiring carefully, especially that to the edge connector. Ensure there are no blobs of solder or whiskers of wire between tracks on the veroboard. Turn the Electron off, remove or turn off any peripherals that use page & FD and then insert the edge connector into the cartridge port nearest to the keyboard, taking care to get it the right way around. If you do have difficulties, you may need to file a little more off the edge connector.

Now turn the Electron on. If the normal start up message doesn't appear within a second or so turn off immediately, unplug the edge connector and check the wiring.

Once a start up message has appeared, type in Program I and run it:

```
10 ?&FD00 = 0  
20 FOR I=0 TO 255  
30 ?&FD00 = I  
40 FOR J=1 TO 200:NEXT J  
50 NEXT I
```

You should see the LEDs go on in sequence as the test runs - they will effectively display the binary value (on is a 1, off is a 0) of the number sent to the latch by line 30.

Should this test work, congratulations, you've got the output port working. Next month we'll finish the I/O port off and start looking at programming it and connecting other devices to it.

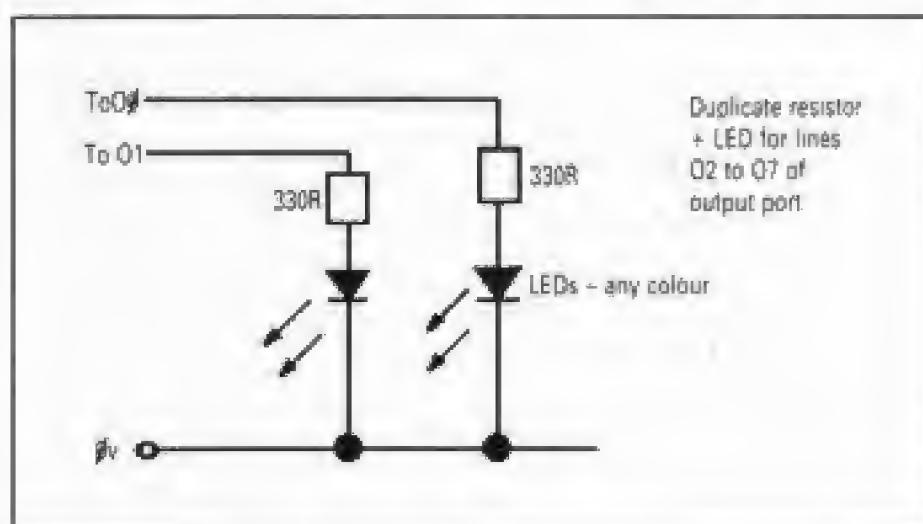


Figure IV: Wiring up the output port

## TWO WAYS TO ENSURE YOU GET electron user EVERY MONTH

1. Complete and mail subscription form on Page 45
2. Hand this form to your newsagent.

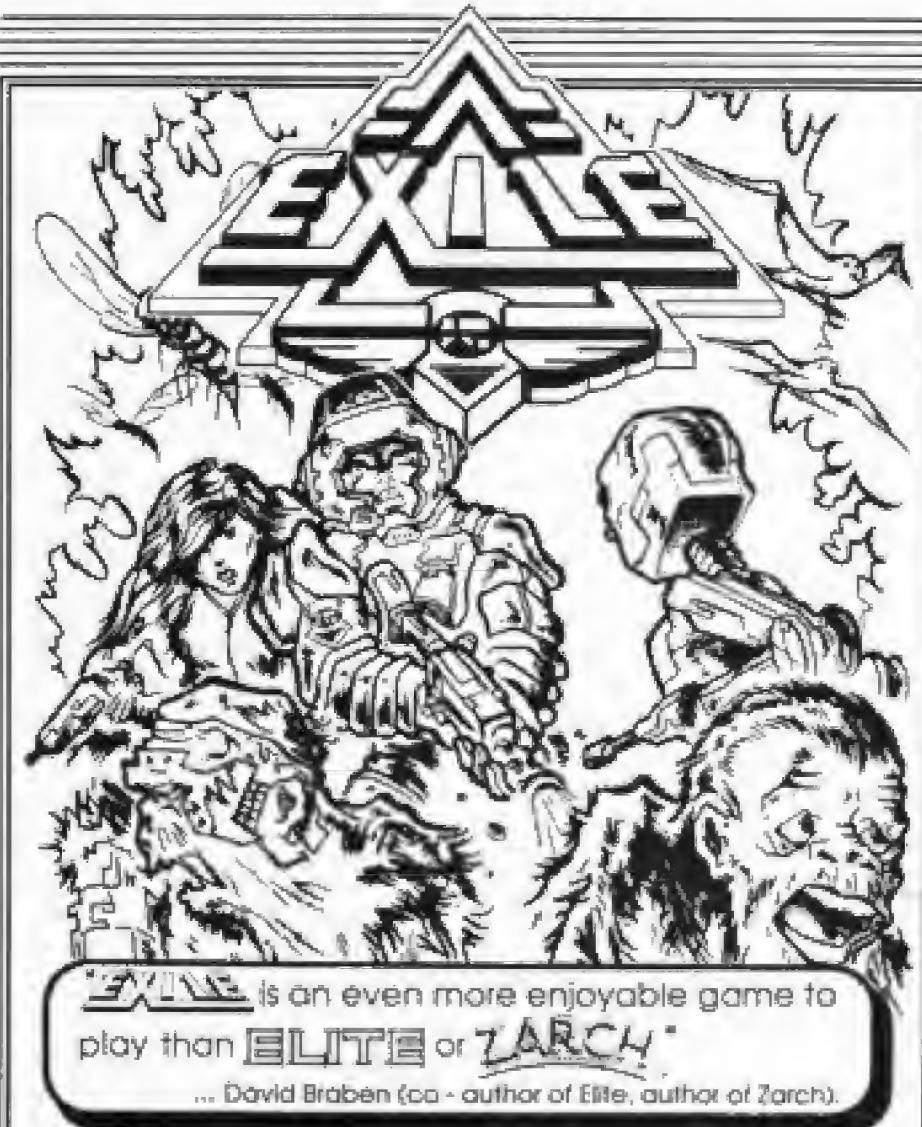
Please reserve me a copy of Electron User magazine every month until further notice.

- I will collect  
 I would like it delivered to my home.

Name \_\_\_\_\_

Address \_\_\_\_\_

Note to newsagent: Electron User should be obtainable from your local wholesaler, or contact Mike Rice Circulation Manager on 0424 430422



SUPERIOR SOFTWARE  
ACORN SOFT

Telephone: (0532) 459453

Available soon on the BBC Micro and Electron. EXILE is designed and written by Peter Irvin and Jeremy Smith.

**Try to avoid getting in a jam in Stuart Bain's fast arcade game**



**G**OBBLER is a superb variation on that old arcade favourite, Pac-Man. For those that have never seen the game – and it's hard to believe that there is anyone who hasn't – the object is to guide your little man around a complex maze in search of raspberry jam tarts. These are littered all over the place and simply running over one enables you to gobble it up.

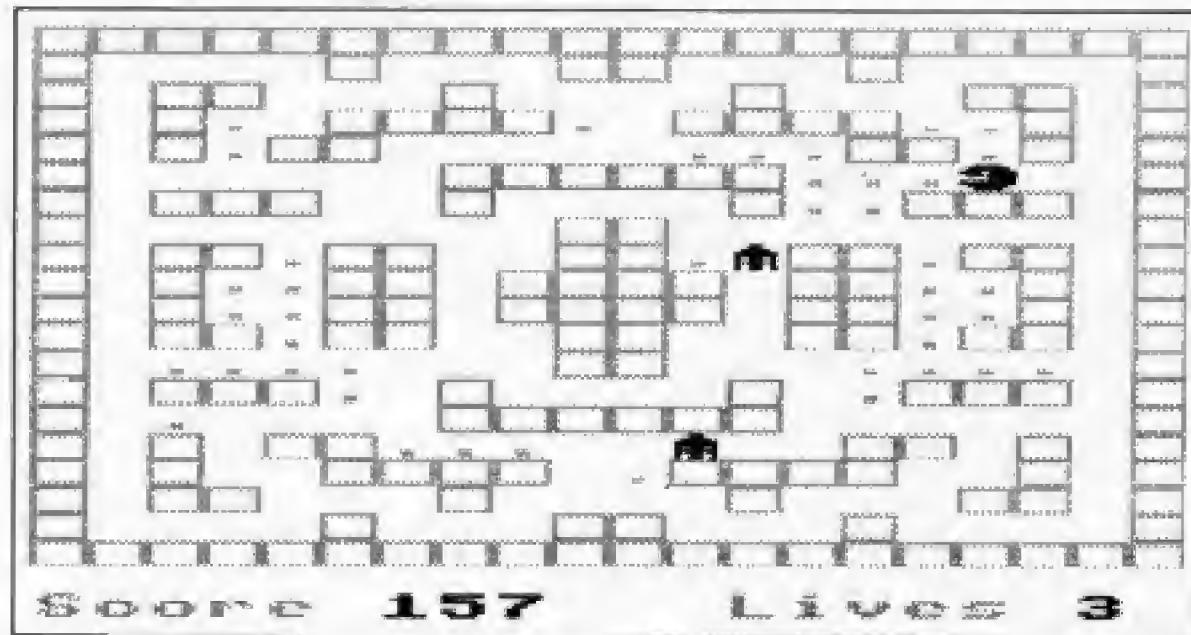
Two monstrous ghostly creatures inhabit the maze and devour anyone who dares enter. Watch out for these crafty devils, as they sneak up behind you and pounce when you least expect it.

You have three lives, and if you manage to gobble up all the jam tarts you'll be transported to another maze, with even meaner adversaries.

Never more than two monsters chase you, but they get faster as each screen is completed – without any apparent loss of speed in your character's movement.

Although Gobbler isn't by any means a new idea in arcade games, dating as it does back to the very early days of computers and arcade machines – what makes this version interesting is that it is so compact. There are two complete mazes and the monsters exhibit quite a high degree of intelligence.

Programmers should study the listing, as many tips and techniques can be learnt from it. The game is much faster than you might expect – it's blinding in Turbo mode – and the movement is very smooth too.



#### CONTROLS

- Z Left
- X Right
- \* Up
- ↓ Down

#### VARIABLES

S(19,19)	Array to store the maze
L	The level
sc	The score
m	Number of men left
A%(1)	Coordinates of monster one
B%(1)	Coordinates of monster two
X%	Your x coordinate
Y%	Your y coordinate

```

10 REM Gobbler
20 REM By Stuart Bain
30 REM (c) Electron User
40 MODE 5
50 YOU23,1,0;0;0;23,224,60,126,23
9,127,15,255,126,60,23,225,24,60,126,1
26,90,126,90,90,23,226,255,129,129,129
,129,129,129,255
60 DIMS(19,19),A%(1),B%(1)
70 L=1:m=3:sc=0
80 REPEAT
90 RESTORE
100 IF RND(1)<3 FOR I=1 TO 10:READ A
$:NEXT:$=NEXT
110 FOR I=0 TO 9
120 READ A$
130 FOR J=1 TO 10
140 BS=MOSCAS,J,1)
150 S(J-1,1)=--66*(BS=. )+226*(BS=0
)
160 NEXT:$NEXT
170 READ C
180 FOR I=0 TO 9
190 FOR J=10 TO 19
200 S(I,J)=S(19-J,1):NEXT,J:FORJ=10TO
19:FORJ=0TO19:S(I,J)=S(I,19-J):NEXT,J:S
(1,1)=32
210 REPEAT
220 CLS:COLOUR1
230 FOR I=0 TO 19
240 FOR J=0 TO 19
250 VOUSC(I,J)

```

```

260 NEXT:$NEXT
270 PRINT TAB(0,21);Score ,TAB(12);
Lives ';
280 COLOUR 3:PRINT;m;TAB(6,21);sc
290 SOUND,-1,150,3
300 XZ=1:YZ=1
310 AX(0)=38:AY(0)=1:BX(0)=1:BY(1)=1
8:d=0
320 YOU 17,3,31,1,1,224,17,2,31,1,18
,225,31,18,7,225
330 REPEAT
340 XZ=XZ+YZ=YZ
350 HZ=INKEY-96-INKEY-67
360 VZ=INKEY-73-INKEY-105
370 IF HZ=0 AND VZ=0 GOTO370 ELSE IF
HZ AND VZ VZ=0
380 IF S(XZ+HZ,YZ+VZ)<>226 XZ=XZ+HZ:
YZ=YZ+VZ:YOU 31,1,1,224,17,3,31,XZ,YZ
,224:IF S(XZ,YZ)=46 sc=sc+1:c=c-1:SOUN
D 1,-15,180,1:S(XZ,YZ)=32:PRINT TAB(6,
21);sc
390 FOR IZ=0 TO 1
400 IF RND(IZ)>L FORJ=0TO 30:NEXT, E
LSE xZ=A%(1):yz=B%(1):HZ=SGN(XZ-xZ):
YZ=SGN(YZ-yZ):xZ=xZ-HZ*S(XZ,YZ)+HZ*Y
Z<>2
261:yz=yZ-VZ*(S(xZ,yZ+VZ)<>226):YOU17,
1,31,A%(1),B%(1),S(A%(1),B%(1)),17
,2,31,xZ,yZ,225:A%(1)=xZ:BY(1)=yz:NE
XT
410 IF (XZ=AX(0) AND YZ=AY(0)) OR (X
Z=A%(1) AND YZ=B%(1)) d=TRUE
420 UNTIL c=0 OR d

```

```

430 IF c=0 L=L-1*(L<9):FOR I=310 TO
140 STEP 10:SOUND 1,-1,1,3:NEXT:UNTIL
1:UNTIL 0 ELSE d=0:e=e-1:SOUND 1,-1,40
,3:SOUND 1,-1,10,3:UNTIL d=0:UNTIL 1
440 COLOUR 2
450 PRINT TAB(1,24)" A M E   O V E
R " Press Space to play"
460 REPEAT UNTIL INKEY=99
470 RUN
480 DATA 0000000000
490 DATA 0....0...
500 DATA 0.000...0
510 DATA 0.0.000.0
520 DATA 0.0....0.
530 DATA 0...0..0.
540 DATA 0.0.00.0..
550 DATA 0.0....0.
560 DATA 0.0000...0
570 DATA 0...0...0.0
580 DATA 195
590 DATA 0000000000
600 DATA 0....0...0
610 DATA 0.00...0...
620 DATA 0.0..0000.
630 DATA 0.0.00....
640 DATA 0.....000
650 DATA 0.000...0..
660 DATA 0.....0...
670 DATA 0.00.00..0
680 DATA 0.0..00.00
690 DATA 199

```

If you want to start doing more with your micro than just playing games, this package is your ideal introduction to the four most popular applications for professional computers. All the programs have been designed for simplicity, so even a child can use them. Yet they include advanced features not yet available on programs costing many times as much!

**Finalist for the Home Software of the Year Award**



*Contains 32 page booklet giving clear, easy-to-follow instructions on all 4 programs*

**Word Processor:** Ideal for writing letters and reports. There is a constant display of both time and word count, plus a words-per-minute display to encourage the budding typist! A unique feature is the double-size text option in both edit and printer mode — perfect for young children and people with poor vision.

**Database:** You use this for storing information, just like an office filing cabinet. Facts you have entered can be quickly retrieved by just keying in a word or part of a word. They can be sorted, replaced, saved for future use or printed out.

**Spreadsheet:** Enables you to use your micro for home accounts or pocket money records. It creates a display of numbers in rows and columns. Continuous updating is possible, and a changed figure can be instantly reflected throughout the rest of the spreadsheet. Your results can be saved, to be used for future updates, or can be fed into its associated program . . .

**Graphics:** Part of the spreadsheet section, it lets you draw bar charts, pie charts and histograms to give a graphic presentation of your statistics. Helps to give life and colour to the dullest figures!

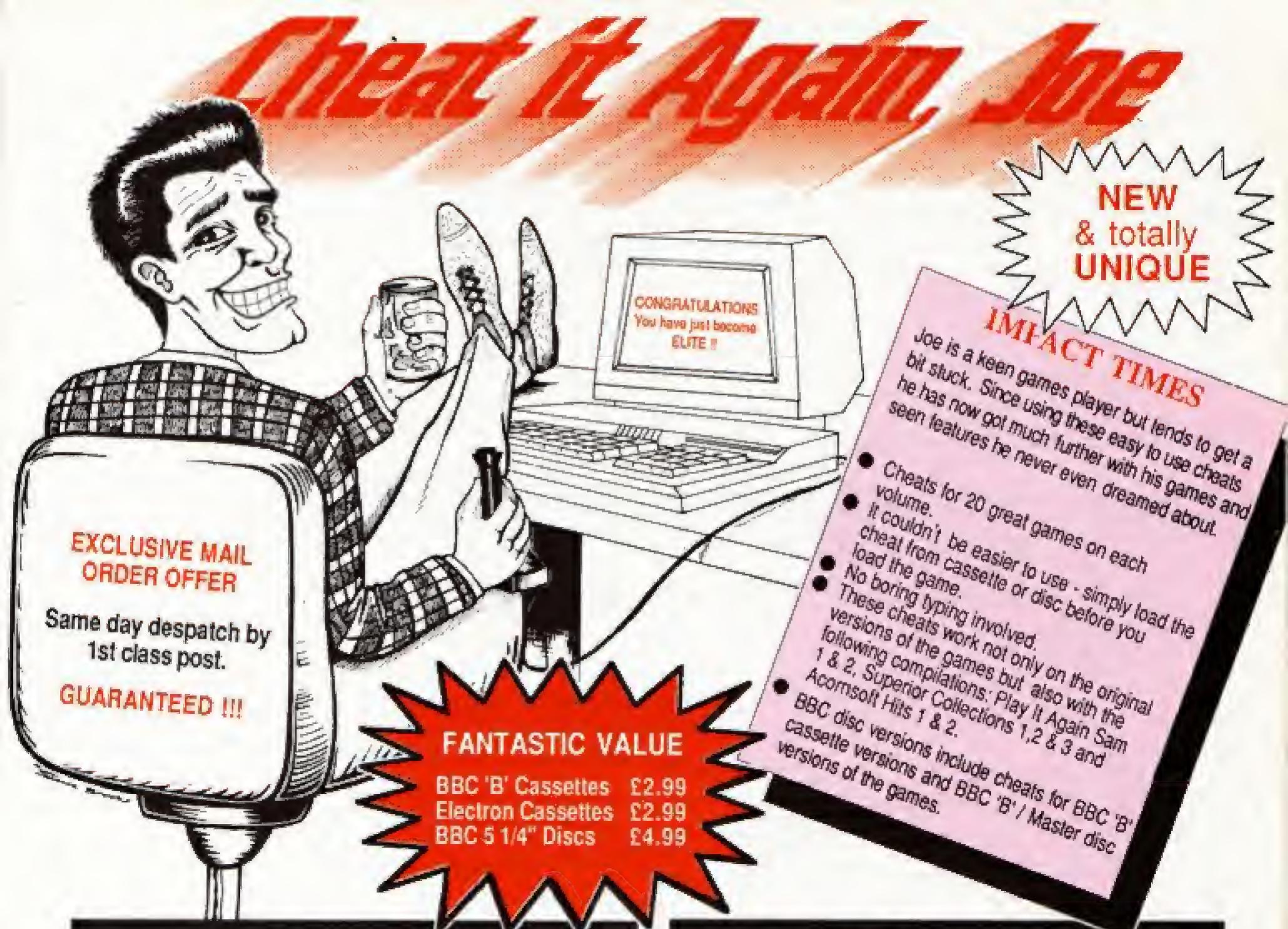
★ Word Processor  
★ Database

★ Spreadsheet  
★ Graphics

**Now they're all together - in ONE simple package**

*Four full-scale programs for an incredible low, low price!* £5.95 cassette

**TO ORDER PLEASE USE THE FORM ON PAGE 45**



**NEW  
& totally  
UNIQUE**

### **IMPACT TIMES**

Joe is a keen games player but tends to get a bit stuck. Since using these easy to use cheats he has now got much further with his games and seen features he never even dreamed about.

- Cheats for 20 great games on each volume.
- It couldn't be easier to use - simply load the cheat from cassette or disc before you load the game.
- No boring typing involved.
- These cheats work not only on the original versions of the games but also with the following compilations: Play It Again Sam 1 & 2, Superior Collections 1, 2 & 3 and Acornsoft Hits 1 & 2.
- BBC disc versions include cheats for BBC 'B' cassette versions and BBC 'B' / Master disc versions of the games.

### **EXCLUSIVE MAIL ORDER OFFER**

Same day despatch by 1st class post.

**GUARANTEED !!!**

### **FANTASTIC VALUE**

BBC 'B' Cassettes	£2.99
Electron Cassettes	£2.99
BBC 5 1/4" Discs	£4.99

### **CHEAT IT AGAIN, JOE Volume 1**

Here are a few samples of the cheats in this volume:-

#### **ELITE**

Start the game with all the equipment already installed in your ship including mega-lasers which will destroy almost any ship with one hit. You also get 10,000 credits to compliment your 255 missiles, energy unit, escape pod, docking computer and much more!

#### **CITADEL**

Marduk the evil dictator will have no chance as you are completely immortal and can pass through any door without a key. The death monks become harmless and you can even speed up the game to complete it in record time.

#### **RAVENSKULL**

Start immediately on any level without completing the others. Don't worry if you have any problems as you have infinite lives to keep you in the game right through to the end.

#### **BBC 5 1/4" DISC Only £4.99**

1. Elite
2. Citadel
3. Ravenskull
4. Thrust
5. Stryker's Run
6. Repton 1
7. Repton 2
8. Star Wars
9. Quest
10. Thunderstruck 2
11. Bonecruncher
12. XOR
13. Elixir
14. Living Daylights
15. Deathstar
16. Starship Command
17. Arcadians
18. Kountyard
19. Despatch Rider
20. Phantom

#### **BBC CASSETTE Only £2.99**

1. Elite
2. Citadel
3. Ravenskull
4. Thrust
5. Repton 1
6. Repton 2
7. Star Wars
8. Quest
9. Thunderstruck 2
10. Bonecruncher
11. Plan B
12. Killer Gorilla
13. Elixir
14. Living Daylights
15. Deathstar
16. Starship Command
17. Arcadians
18. Kountyard
19. Despatch Rider
20. Phantom

#### **ELECTRON CASSETTE Only £2.99**

1. Elite
2. Citadel
3. Ravenskull
4. Thrust
5. Repton 1
6. Repton 2
7. Star Wars
8. Quest
9. Stryker's Run
10. Bonecruncher
11. Plan B
12. XOR
13. Elixir
14. Thunderstruck 2
15. Deathstar
16. Starship Command
17. Arcadians
18. Kountyard
19. Despatch Rider
20. Phantom

### **CHEAT IT AGAIN, JOE Volume 2**

Examples of cheats in volume 2:-

#### **REPTON 3** **REPTON AROUND THE WORLD** **THE LIFE OF REPTON**

#### **CODENAME: DROID**

Why not make Repton's life a little easier. All the passwords & edit codes. See the last 3 maps on every file. You'll have infinite lives & infinite time to complete every screen. Plus you'll be immortal to boulders, spikes and monsters.

#### **ICARUS**

Our cheats will help Commander Stryker a great deal. You may move around at an amazing speed, and have infinite lives, infinite energy cells, infinite Blaster/suit energy and infinite passcards.

You may practice on any of the 20 levels whenever you want. Plus you'll have infinite credits and energy, and/or a fast blaster recharge.

#### **BBC 5 1/4" DISC Only £4.99**

1. Repton 3
2. Around The World
3. Life of Repton
4. Galadore
5. Codename: Droid
6. Paperboy
7. Craze Rider
8. Paperboy
9. Saigon
10. Spellbinder
11. Palace of Magic
12. Plan B 2
13. Impact
14. Magic Mushrooms
15. Planetoid
16. Ransack
17. Imogen
18. Uridium
19. Karate Combat
20. Repton 3 - Passwords + Edit codes

#### **BBC CASSETTE Only £2.99**

1. Repton 3
2. Around The World
3. Life of Repton
4. Codename: Droid
5. Paperboy
6. Saigon
7. Spycat
8. Spellbinder
9. Palace of Magic
10. Plan B 2
11. Combat Lynx
12. Icarus
13. Impact
14. Magic Mushrooms
15. Planetoid
16. Ransack
17. Imogen
18. Uridium
19. Karate Combat
20. Repton 3 - Passwords + Edit codes

#### **ELECTRON CASSETTE Only £2.99**

1. Repton 3
2. Around The World
3. Life of Repton
4. Codename: Droid
5. Paperboy
6. Saigon
7. Spycat
8. Spellbinder
9. Palace of Magic
10. Plan B 2
11. Combat Lynx
12. Icarus
13. Impact
14. Magic Mushrooms
15. Planetoid
16. Ransack
17. Killer Gorilla
18. Craze Rider
19. Galadore
20. Repton 3 - Passwords + Edit codes

### **HOW TO ORDER**

Simply fill in the coupon and send with a cheque or postal order to Impact Software.

\* All 'Joes' despatched by 1st class post on same day as order (Unparalleled Service)

\* Free postage and packing

To : Impact Software, Neepsend House, 1 Percy St., Sheffield, S3 8AU.  
Please send me the following:

BBC Cassette	Electron Cassette	BBC 5 1/4" Disc	Price
--------------	-------------------	-----------------	-------

Cheat it Again, Joe Vol.1




Cheat it Again, Joe Vol.2




I enclose a cheque / PO (made payable to Impact Software) for £ \_\_\_\_\_

(BLOCK CAPITALS PLEASE)

Name \_\_\_\_\_

Address \_\_\_\_\_

Postcode \_\_\_\_\_

**IMPACT**

*Software*

Impact Software  
Neepsend House  
1 Percy Street  
Sheffield S3 8AU  
Tel. (0742) 769950

**SOFTWARE**

32, Hartfield Road, Sunbury on Thames, Middlesex TW16 5PT

**ONLY £7.45 EACH!!!**

Barbarian	Saigon
Impact	Icarus
Spycat	Ransack
Kourtyard	Skirmish
Quest	Breakthrough
Play it Again Sam	Play it Again Sam 2
Indoor Sports	Winter Olympiad
10 Computer Hits 4	5 Star Games 3
Bonecruncher	Elixir
Spellbinder	Palace of Magic
Spy vs Spy	Boulderdash
Powerpack 1	Powerpack 2
Supener Col. 3	Graham Good Cricket
Paperboy	Craze Rider
Strykers Run	Codename Droid
Star wars	Ravenskull
Ziggy - £8.90	Repton Thru time - £5.45

**ELECTRON  
SOFTWARE**

**Free Postage  
(overseas  
add £1.00)**

**SAE for full  
price list**

**Cheques/PO's to:  
E.J. Software  
Send to above  
address**

**OTHER CASSETTES AND DISCS AVAILABLE ON REQUEST**

## ADVERTISERS' INDEX

21st Software .....	2
Database Exhibitions .....	13
Database Software .....	52
EJ Software .....	54
Impact Posters .....	53, 55
Mandarin Software .....	3
Mithras Software .....	47
Peter Dunn .....	54
PRES .....	28, 29
Qualsoft .....	10
RDS Ltd. ....	47
RODH Designs .....	54
Slogger Ltd. ....	34, 35
Software Bargains .....	7
Superior Software .....	2, 5, 56
Towerhill .....	46, 47
Voltmace .....	54

### ROM/RAM EXPANSION BOARD 2 for the ELECTRON PLUS 1

can now take up to 32k Sideways RAM

Will hold 7 ROMS or 6 ROMS + 16k RAM or 5 ROMS + 32k RAM

32k RAM = 1 \* 62256, 16k RAM = 2 \* 6264 or 1/2 \* 62256

Fits inside the PLUS 1. Write protect switch for Sideways Ram.

Only five leads to solder on. Very easy to fit yourself.

Ours working with 64k Electron + dual disc drive.

4 options:

- |  |        |
|--|--------|
| 1. Bare PCB plus building instructions   | £17.50 |
| 2. Fully assembled board less roms and rams  | £30.95 |
| 3. Fully assembled board plus 16k RAM (2 * 6264)<br>(while stocks of 8k chips (6284) last) | £37.50 |
| 4. Fully assembled board plus 32k RAM (1 * 62256)  | £45.95 |
|  | £17.95 |

### 1MHz BUS and ROM BOARD

Plugs into any cartridge slot, 2 rom sockets, gold plated edge contacts, standard I/O bus connector (as BBC).

All prices incl. no more to pay (UK).

RODH Designs

36 Serum Road, Eastleigh,

Hants, SO5 2AN.

Tel. 0703 260900 (best after 3.30)

**RODH  
DESIGNS**

## JOYSTICKS— THE COMPLETE SOLUTION



DELTA 3B SINGLE-JOYSTICK TO FIT FIRST BYTE INTERFACE

FIRST BYTE INTERFACE	£14.95
PLUS 1 INTERFACE	£19.95
SPECIAL OFFERS	£49.95
DELTA 3S + FIRST BYTE INTERFACE TOGETHER	£29.95
DELTA 3B SINGLE AND PLUS ONE INTERFACE TOGETHER	£59.95

DELTA 3B SINGL for a BBC B or ELECTRON PLUS 1      £14.95  
A single joystick that in some ways can act as two. The custom made special "low noise" potentiometers are wired so that it will work as a left hand or right hand joystick. It can even run some programs written for two joysticks and has the fire buttons of both.

### SPECIAL OFFERS

Webwars	99p
Repton 2	£2.49
Both for	£2.99

DELTA 3B TWIN for a BBC B or ELECTRON PLUS 1      £21.95  
A direct but improved alternative for the original ACCORN joysticks, with 2 joysticks wired to one plug. As with all our joysticks they have the fast action sprung to centre return of the steel shafted nylon covered joystick. The light action makes them ideal to hold and the 3 fire buttons allow left or right-handed use.



PRICES ARE INCLUSIVE OF  
CARRIAGE AND VAT

VISA

**Voltmace**

Unit 9 (Dept. EU)  
Bondor Business Centre  
London Road  
Baldock  
Herts SG7 6HP  
Telephone: (0462) 894410

# THE IMPACT GAMES CLUB

## ARCHIMEDES GAMES

### QUAZAR

Super fast blasting action in this amazing shoot-em-up from our own in-house Impact Software. Superbly animated graphics with parallax scrolling and amazing sound effects. You'll be glad you bought an Archimedes after playing this game as it is a world apart from games you would expect on other machines. Amazing action, amazing value, only £11.95.

Quazar (Impact)	£11.95
Enticer 1 (Impact)	£14.95
Tennaris (Grand Slam)	£15.95
Muscle Control (Minerva)	£11.95
Hoverbird (Minerva)	£11.95
Conqueror (Superior)	£19.95
Zach (Superior)	£15.95
Minotaur (Minerva)	£11.95

## OUR GUARANTEE

- Over 250 titles always in stock.
- Over 98% of orders despatched the day they received by 1st class post.
- We immediately replace any faulty games purchased from us.
- Prices are fully inclusive - nothing else to pay.
- Plus we'll send you a copy of our club magazine with lots more games, game reviews and bargains galore!

## CHEAT IT AGAIN, JOE

(Impact)

Volume 1 - Great cheats for 20 great games. Includes cheats for Elite, Citadel, RavenSkull, Thrust, Rupton 1&2, Star Wars, Quest, Bonecrusher, Elektro, ThunderShack 2, Arcadian, Starship Command, Phantasm, Despatch Rider, Deathstar and many more.  
Volume 2 - Lots more amazing cheats to make life easier including - Rupton 3, Around the World, Life of Rupton, Codename: Droid, Icarus, Impact, Planetoid, Magic Munch, Ransack, Ingénier and many more.

BBC 1" or Electron Cassette

£2.95

BBC 5 1/4" Disc

£4.95

**NEW**

## FREE HELPSHEETS/MAPS

Spend over £4 on games and you may choose any ONE of the following helpsheets/solutions and maps absolutely FREE! Spend over £10 and you may choose any TWO FREE!

Spysoft	[Solution + Map]	Dimension	[Helpsheet + map]	Impact	[Helpsheet + password]
Plan B	[Solution + map]	Tarzan	[Solution + map]	Icarus	[Helpsheet + map]
Quest	[Solution + map]	Scavenger	[Solution]	Sci-Fi Adventure	[Solution]
RavenSkull	[Solution + 4 maps]	Codenamed: Droid	[Solution + map]	Madness Zone	[Helpsheet + password]
Crashel	[Solution + map]	ThunderShack 2	[Solution + map]	Philosopher's Quest	[Solution + map]
Plan B2	[Solution + map]	The 1st Crystal	[Solution + map]	Rupton 2	[Helpsheet + 14 maps]
Spy vs Spy	[Helpsheet]	Solo	[Solution]	Bonecrusher	[Helpsheet + 10 maps]
Softborder	[Solution + map]	Kourtyard	[Solution]	Skirmish	[Helpsheet]
Elec	[Solution + map]	Dunes	[Helpsheet + map]	Ingénier	[Solution]
Paperton	[Helpsheet]	Gibbernes Castle	[Solution + map]	Choir	[Solution]
Twin Kingdom Valley	[Solution + map]	Palace of Magic	[Solution + map]	Quest for Freedom	[Solution + map]
Omega One	[Solution + map]				

## Pipeline (Superior)

At last the long awaited sequel to the excellent RavenSkull. The game is in a new scenario, the moon is, and this your task to prevent mutant androids from destroying the Sulphur plant which is providing Earth with much needed resources. Infinitely superior to RavenSkull. Pipeline features larger screens, more puzzles and superb graphics and screen designer to allow you to create a whole new game if you wish. Highly recommended.

BBC or Electron Cassette

£2.95

BBC 5 1/4" Disc

£3.50

Master Compact 3 1/2" Disc

£11.95

**NEW**

## BUDGET CASSETTES

BBC or Electron

**ACORN SOFTWARE**  
Impact Masters [BBC Only] M  
Impact [BBC Only] M

7.50 11.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

14.95

1

# Pipeline



## PIPELINE – A Fiery Adventure in Space and Time

In the 25th Century, the Earth's supplies of sulphur had become so badly depleted that mining operations were established on Io, one of the moons of Jupiter. Following a volcanic eruption on Io, the robot-controlled extraction platforms have been engulfed in a burning sea of sulphur and are now malfunctioning.

You have been sent to the platforms in a single-handed, death-defying mission, to collect the precious drums of sulphur, close down operations and return to Earth. To complete your task, you must carefully weave your way through a complex series of pipelines in each of four platforms. But beware of the fast-moving flames and carnivorous plants!

Pipeline is a massive four level arcade-adventure, that combines the best features of a game like Ravenskull, with a novel pipeline system. Once you enter a pipe, there is no going back. You are carried past junctions, around bends and over other pipes, to be deposited at the end, wherever that might be.

In addition to an exciting, novel arcade game, Pipeline also includes a character designer and a very powerful level designer. Design your own levels, including intricate puzzles and a vast array of pipeline complexes, and test your route through the pipes directly on the level design screen. With practice, you will soon be able to design complicated and highly unusual games.

BBC Micro Cassette £9.95 Acorn Electron Cassette £9.95  
BBC Micro 5 1/4" Disc £11.95 BBC Master Compact 3 1/2" Disc £14.95

(Compatible with the BBC B, B+ and Master Series computers)

Please make cheques payable to "Superior Software Ltd".

### PRIZE COMPETITION – DESIGN A LEVEL

If you complete Pipeline, you can enter our competition. To enter you should send in your score and submit a level design to Superior Software. Prizes of £100 each will be awarded for the highest score and the best level design. Books on astronomy will be awarded to 20 runners-up. Each prize-winner will also receive a signed congratulatory certificate. The best level designs may be used in a future Superior Software program.  
Closing date: 31st January, 1989.

**SUPERIOR SOFTWARE**  
Limited

**ACORN SOFTWARE**

(Acornsoft is a registered trademark of Acorn Computers Ltd. Superior Software Ltd is a registered user)  
Dept P2, Regent House, Skinner Lane, Leeds LS7 1AX. Telephone: (0532) 459453.

The screen pictures show the BBC Micro version of the game.



24 HOUR TELEPHONE  
ANSWERING SERVICE FOR ORDERS

### OUR GUARANTEE

- All mail orders are despatched within 24 hours by first-class post.
- Postage and packing is free.
- Faulty cassettes and discs will be replaced immediately. (This does not affect your statutory rights).